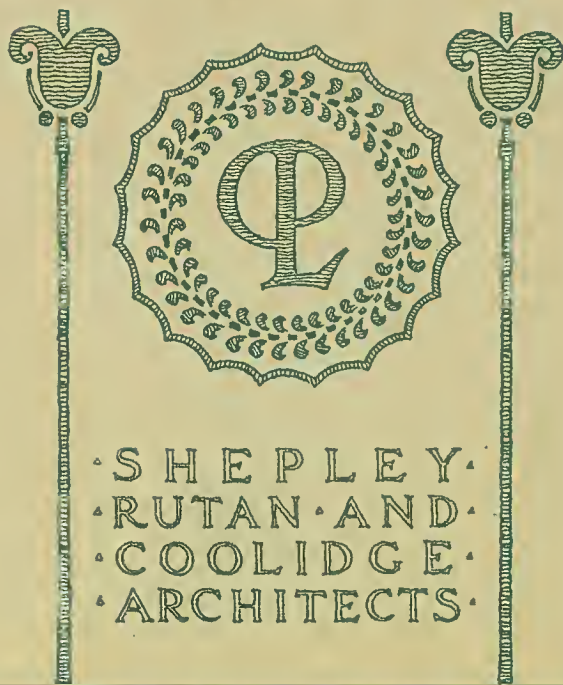


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THE INLAND  
ARCHITECT  
SUPPLEMENT

CHICAGO  
PUBLIC  
LIBRARY



JAN  
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SHEPLEY  
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ARCHITECTS

NO. 6  
VOL. 30

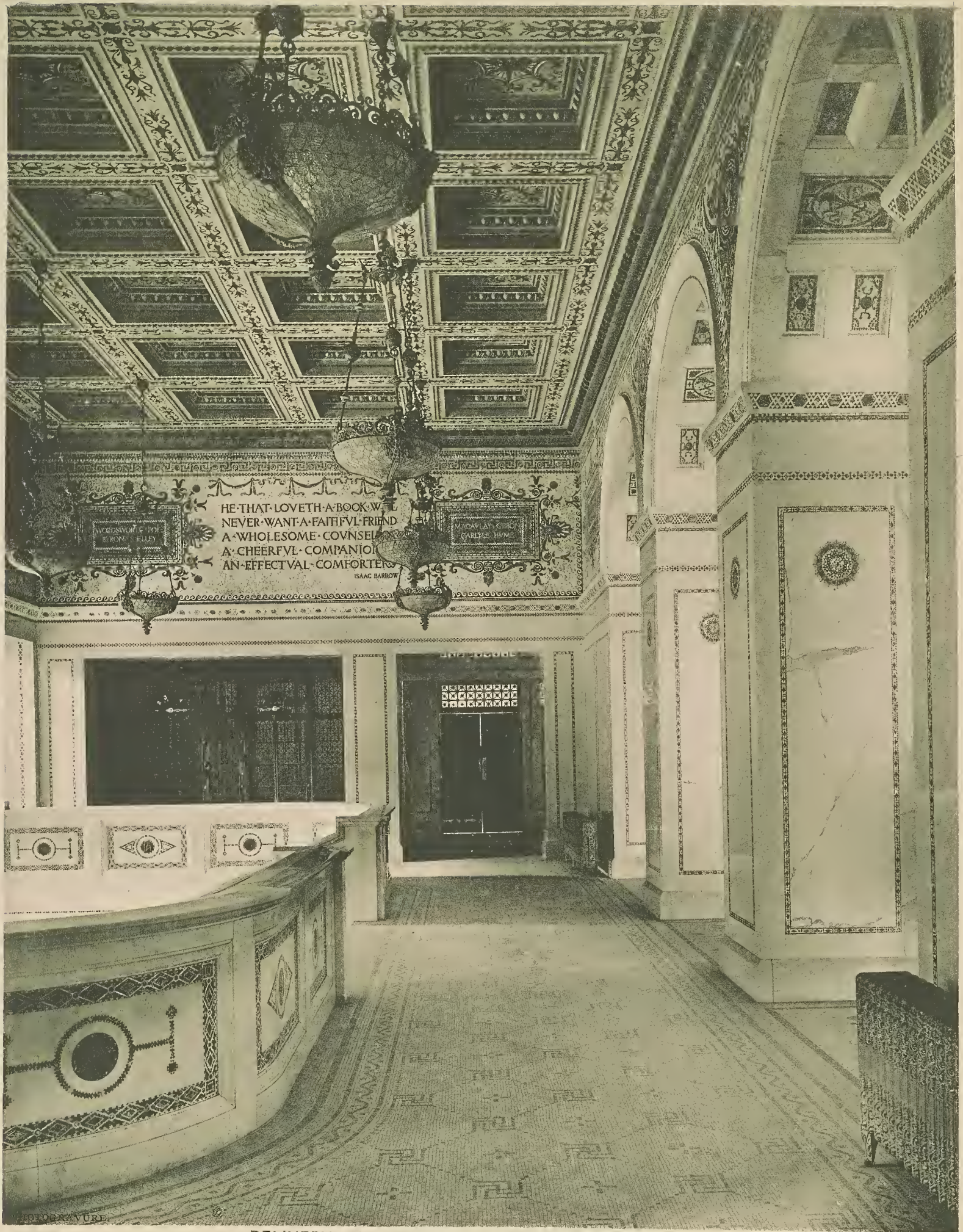
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DELIVERY ROOM LANDING OF GRAND STAIRWAY.



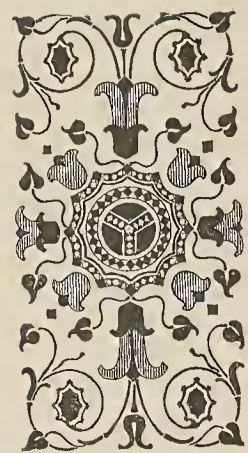


# THE INLAND ARCHITECT

## SUPPLEMENT

### TECHNICAL REVIEW OF THE CHICAGO PUBLIC LIBRARY

BY  
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VOL. XXX

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No. 6.



THE public library of a great metropolis is appropriately the palace of the people. It is the one building which by its very nature is best fitted to exercise a strong refining and elevating influence on the masses. Devoted exclusively to education and art, it makes possible in the intellectual life of the poorest and humblest citizen the active enjoyment of all that is best and noblest in the world's enduring treasures. Literature is

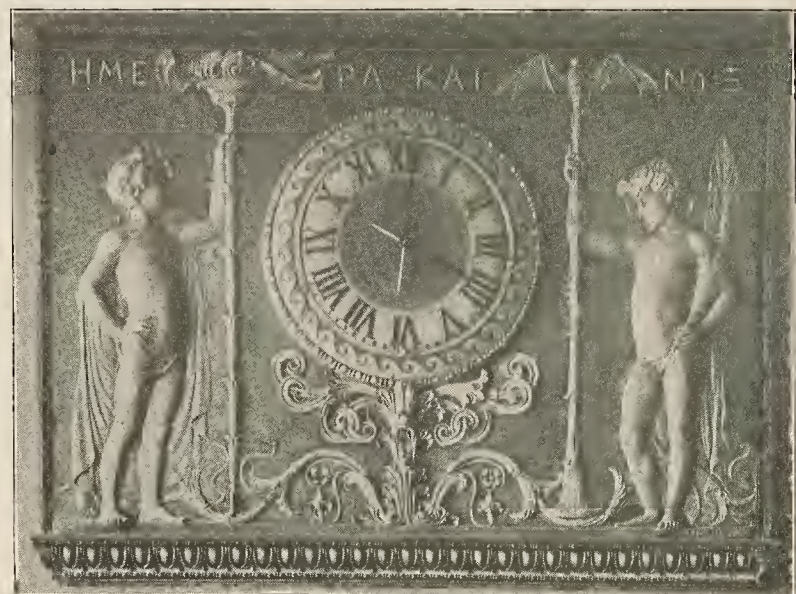
a priceless legacy which cannot be entailed upon any favored few. It is the inheritance of all men, and is fittingly enshrined in a temple so beautiful that rich and poor alike are enchanted thereby. Fortunate, indeed, are the citizens of that city in which the love of literature and art is strong enough to make its public library its most imposing architectural building and its most attractive intellectual resort. In this connection it may not be amiss to refer to the growth of the library idea, beginning with remotest history.

The collection of the intellectual wealth and resources of mankind in libraries doubtless antedates the beginning of authentic history. Even Assyrian kings possessed large collections of inscribed terra cotta tablets, though these were chiefly records and documents, useless and inaccessible to the scholar. A library indeed is known to have existed at Athens as early as 600 B. C., but the earliest collection of literature for the use of the learned was probably the vast one formed at Alexandria by the Ptolemies, for the special benefit of the first endowed community of philosophers and students. Yet these libraries must have been of quite limited value and use, as they were not open to the public and most persons were then unable to read.

Excepting a few collections of ancient manuscripts, all large European libraries have been gathered during the present century, and chiefly during its latter half, as a result of the rapid advance in knowledge and popular education. They were mostly either established and maintained by monarchs, or they are connected with universities; consequently they are not available for use by the people, but only by professors, students, and special investigators, and their privileges are hedged about by many oppressive restrictions, only surmounted by time and patience. Even the library of the British Museum can seat but a few hundred readers, who work under disadvantages in regard to light and ventilation. The people are generally supplied with books by means of subscription lending libraries, like that of Mudie in

London, although the American idea of the public library has recently been adopted in some cities of Europe.

Franklin, the wisest and most far-sighted of Americans, really invented the American public library, when he persuaded a few associates to place their books in a common stock for loaning to each other. He lived to see his idea developed into a great library for free use by the people, its cost being considered just as much a matter of public concern as that of public defense or health. Even the smallest city or village in the country now possesses a respectable collection of books, and the combined beneficial results from these libraries probably equals those of the public schools and exceeds those of the higher educational institutions. Two American library buildings are most frequently



CLOCK IN REFERENCE ROOM, REPRESENTING DAY AND NIGHT.

compared with the new building of the Chicago Public Library; that of the Boston Public Library, and the building recently erected for the Library of Congress at Washington. The first, occupying 51,000 square feet of ground, exclusive of its court, is a dignified and elegant structure with imposing stairway and interiors, but its books are not stored for quick and convenient delivery. The fine paintings on its walls make of it a palace, but materially interfere with its use by readers. It has cost fully \$3,500,000 and the paintings are still incomplete. The Library of Congress, covering an area of 111,000 square feet, is a much larger and more pretentious structure. It has an ample storage for



books, and cost about \$6,700,000. It is much superior in design to most governmental buildings, though it must be considered inferior to the libraries of Boston and Chicago as an example of architectural treatment.

It might have been advantageous to have combined the three great Chicago libraries in a single colossal institution, as in New York. Some economy in administration would doubtless have been secured, though the present arrangement is probably that most convenient to the public, which is always the most potent consideration. Other disadvantages, such as duplication of books and library work, have been avoided by a division of the entire field of knowledge between these three great libraries. The Newberry Library devotes itself to general literature, history, philosophy, theology and a part of the fine arts; the Crerar Library takes up science and the *useful* arts, while the Chicago Public Library provides the books needed for home reading, reference collections, periodicals, public documents and works on the fine and decorative arts.

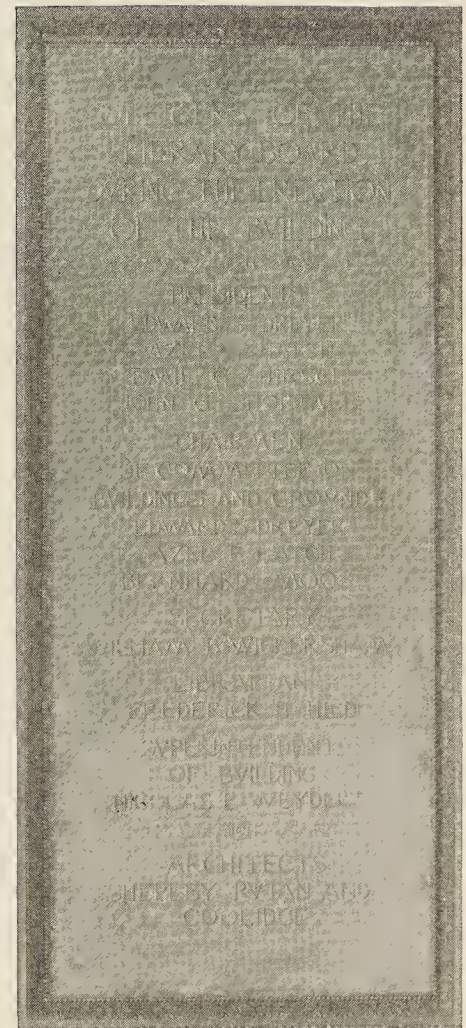
The Chicago Public Library occupies 47,000 square feet, has a total volume of 4,150,150 cubic feet, has cost less than \$2,000,000, the limit of cost originally fixed by the Library Board, or not quite 43 cents per cubic foot. Its collection of books was virtually commenced by Thomas Hughes, who secured for the purpose 7,000 volumes from English authors and publishers soon after the great fire of 1871, and these formed a nucleus for the city library, which was then located in the temporary City Hall on the site of

the present Rookery building. It has since occupied various places, and is now housed in its fifth home. The location of the new library building is of historical interest, being a portion of the site of the former military post and agency, for a long time afterward reserved as a park. The outlook over the park and lake makes this one of the best locations in the city, with a possibility of enlargement by another adjacent building on the park when required. The library now contains 226,000 volumes, increases about 10,000 volumes annually, had a total circulation of 2,700,000 books and peri-

odicals for the last year, which is the largest of any public library, and 59,000 cards are now in the hands of its

readers. The library is open thirteen hours on week days and nine hours on Sundays and holidays. Its total income is \$240,000 annually; \$125,000 is paid to 125 to 150 employees, and \$35,000 is available for the purchase of new books, the largest amount per year expended by any American public library. Forty branch stations and six reading rooms in other parts of the city are supplied by an efficient transfer service.

The Library building occupies the rectangle between Michigan avenue and Garland place, Randolph and Washington streets, with entrances at its north and south ends, its longest façade being on the avenue, with a court in the rear for future extensions. Its extreme dimensions are  $352\frac{1}{2}$  by  $146\frac{1}{3}$  feet and the top of its cornice is 90 feet above the sidewalk, exclusive of the crowning balustrade. Its exterior is of Bedford limestone with granite base. The external walls are entirely built of stone and are without a steel skeleton. The floors are of steel beams and hollow tile arches. The upper walls and ceilings are plastered with Keene's cement. The floors are mostly of mosaics or tiles, excepting the floors in offices and workrooms, which are of wood, and the walls are generally wainscoted or paneled in marble. The building is therefore not only fireproof, but it is practically incombustible. A very careful examination reveals no defects in the construction of the building, which rests on piles, the tips of which are driven to an average depth of 74 feet below the sidewalk.



BRONZE TABLET.



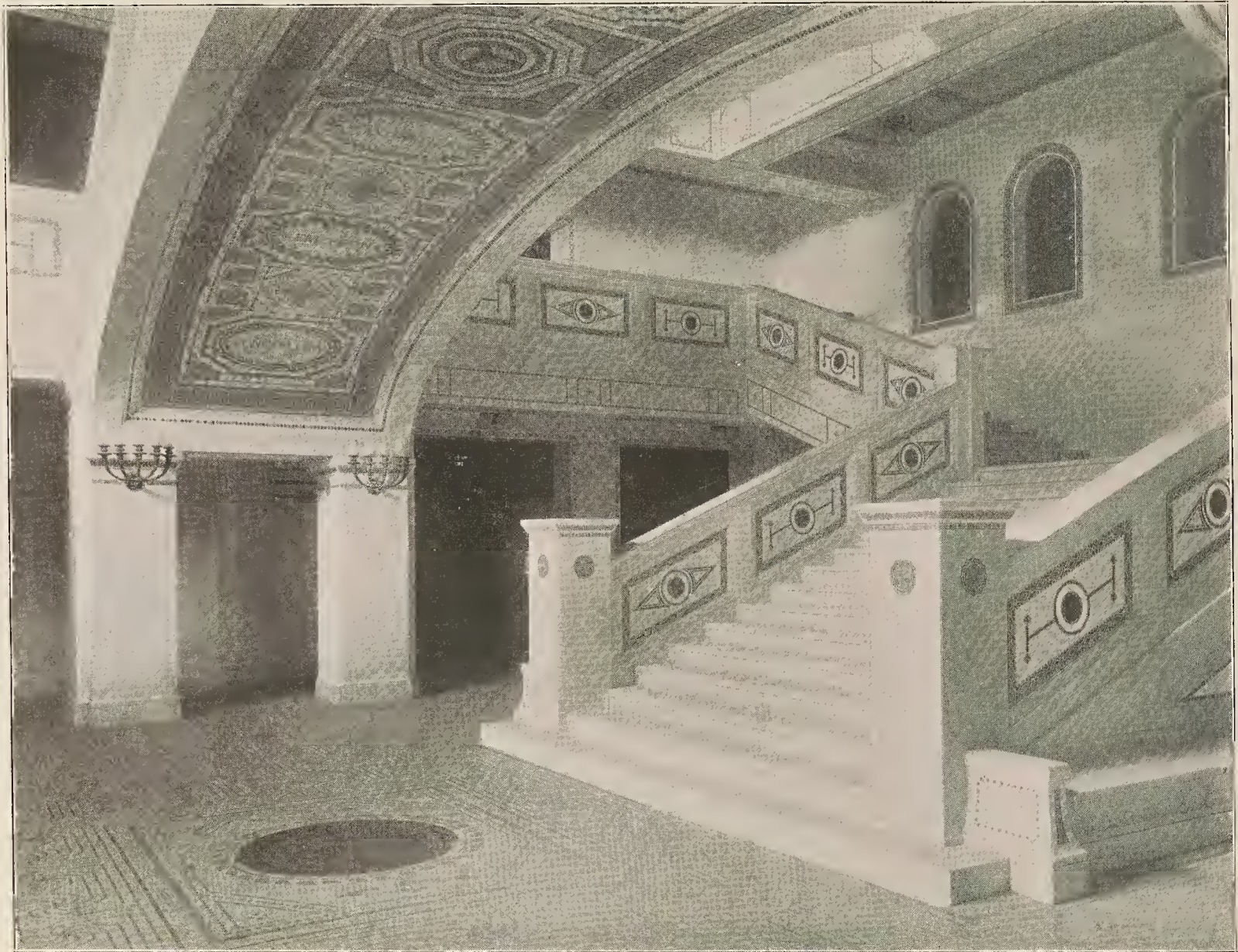
MAIN ENTRANCE WASHINGTON STREET.



In studying the problem of library design, several primary requisites present themselves in perhaps the following order of importance:

1. Convenient access to rooms for public uses.
2. Spacious delivery and reading rooms.
3. Study rooms for specialists and scholars.
4. Ample and compact storage of books near delivery room.
5. Rooms for reference books and special collections.
6. Administrative offices and workrooms.
7. Space for machinery, heating and lighting plant.

the plan and arrangement of the building. This was much complicated by the necessity of providing rooms for the G. A. R. organizations, with a separate entrance, and a series of halls and stairways. After these plans had been agreed upon, the architects for the building were selected by competition, and the plans and arrangement of the building were not afterward materially changed from those previously adopted by the Board. This imposed very serious restrictions upon the selected architects, whose task would have been much lighter had a mere programme of requirements been furnished to them, although the completed



GRAND MARBLE STAIRWAY—WASHINGTON STREET ENTRANCE.

8. All rooms so arranged that they can easily be kept clean.
9. Satisfactory heating, lighting and ventilation.
10. Durable construction and decoration.
11. Dignified and refined exterior.
12. Elegance and harmony in the treatment of the interior, all in full accord with the uses of the rooms.

These requirements are thoroughly fulfilled in the Chicago Public Library.

The Library Board and its Librarian wisely devoted ample time to a careful study of the problem, and to the elaboration of

building might not then have been more satisfactory than the existing structure, which is evidence of the infinite tact and skill in design exerted by the architects in mastering one of the hardest architectural problems ever proposed in Chicago. To the resident member of the firm of Shepley, Rutan & Coolidge, Mr. C. A. Coolidge, is chiefly due the credit for the design and construction of the building, and for its decorations.

As an evidence of the great labor required from the architects of the building, it should be stated that 1,200 drawings were made for it, besides numberless sketches, which fully occupied twenty-

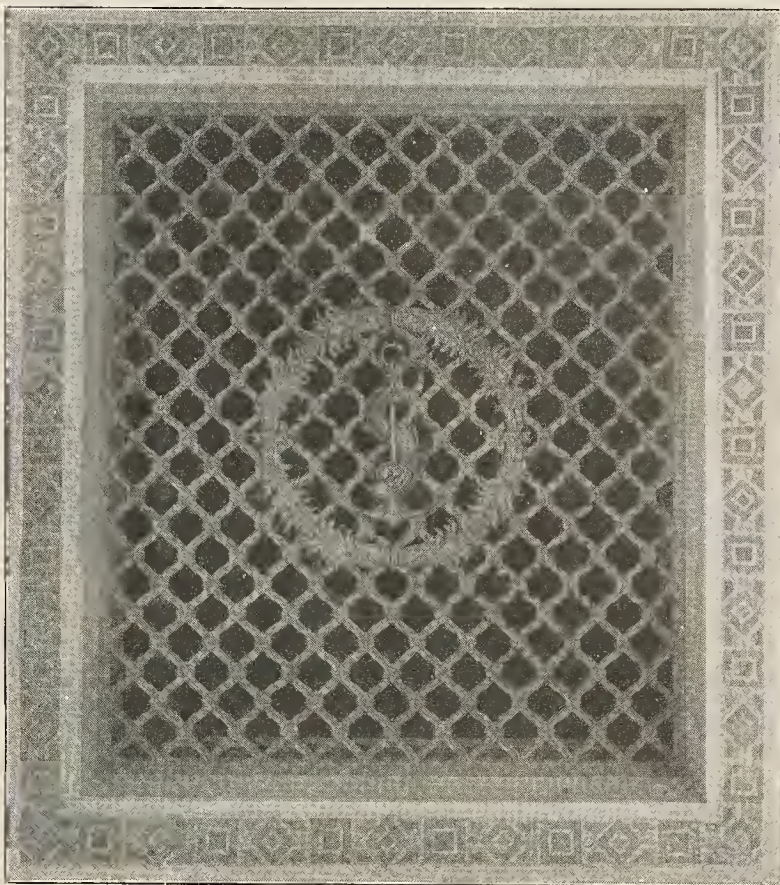


five draftsmen for one year. All of the internal furniture, fixtures and decorations were designed by the architects, no stock or trade fittings being used in the building.

The Library has a present stack capacity for 300,000 volumes, and equal reserve space for stacks. The ultimate total capacity of the building for books will be 2,000,000 volumes, by adding stack rooms in the rear.

A list of the more important rooms with their approximate floor areas will be of interest for comparison with other libraries. The G. A. R. rooms are not here included:

Station department .....	1,800 square feet.
Receiving room.....	1,900 " "
Bindery .....	3,000 " "
Employes' cloak and lunch rooms..	3,300 " "
Janitors' and storage rooms .....	4,400 " "
Public document .....	3,600 " "
Patent records.....	1,700 " "
Reading rooms, lower floor.....	5,200 " "
Bound newspaper room.....	1,900 " "
Cataloguing rooms.....	3,600 " "
Secretary.....	700 " "
Registry .....	600 " "
Librarian's rooms.....	1,000 " "
Order department .....	700 " "
Delivery room.....	6,700 " "
Stack rooms.....	9,000 " "
Study room .....	1,600 " "
Reference books room .....	1,400 " "



BRONZE WINDOW GRILL, MAIN STAIRWAY.

Public catalogue room .....	1,100 square feet.
Reference reading room .....	5,200 " "
Periodical reading room .....	7,500 " "
Back number room .....	2,100 " "

Unassigned rooms.....	3,600 square feet.
Director's room.....	1,600 " "
Special collection room .....	2,000 " "
Art reading room.....	1,600 " "
Art library.....	3,500 " "

#### The Exterior.

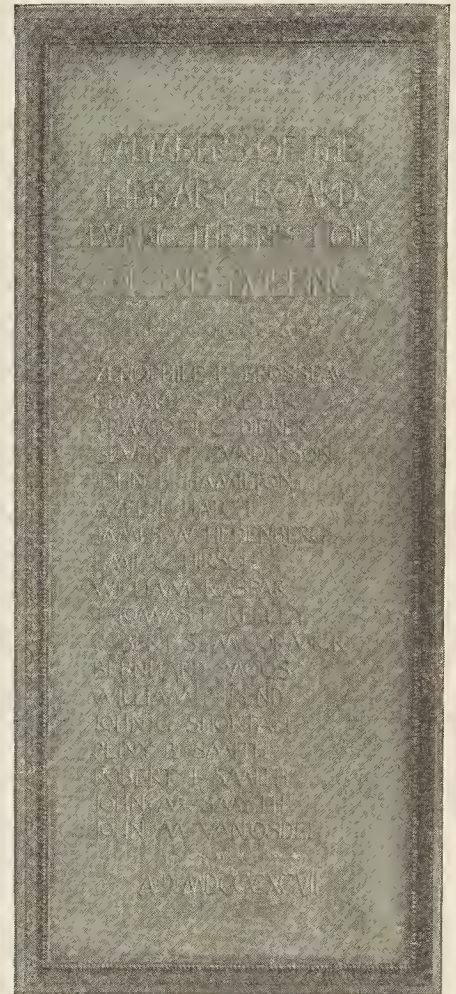
The exterior is ninety feet in height from the sidewalk to the balustrade, and this height is approximately divided into five equal parts, one part being assigned to the podium or ground story, and two parts to each upper story. The podium has a molded cap and high base, projects slightly beyond the wall plane, but is otherwise perfectly plain in treatment, and even the windows are merely rectangular openings without architrave or ornament of any kind.

Different parts of the building being divided into three, four or five stories above the basement, it is evident that the architects found great difficulty in reducing their general design of the exterior to two uniform stories above a podium or base story, since one or even two floors frequently cross the great windows of the façades. This was done with great ingenuity by dividing the glass by an iron bar at the level of the intersecting floor, then coving the edge of the floor behind

it, and painting this cove dark, so that the edge of the floor is not noticeable externally. This is a much better solution of the problem than to have carried a stone transom across the window to cover the edge of the floor.

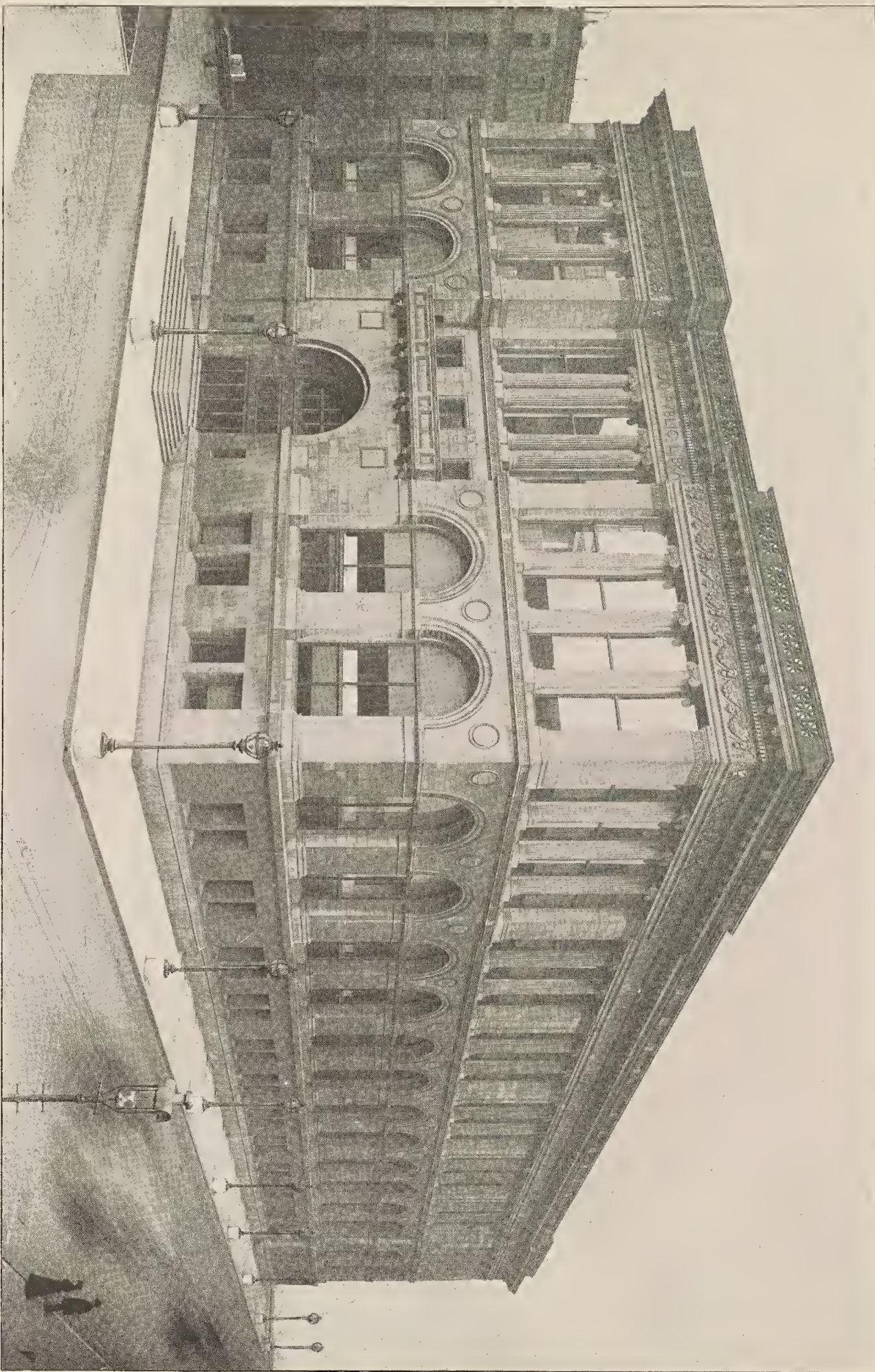
The middle story is composed of rectangular piers between large windows, and these are connected by semicircular arches. These piers have molded bases and caps, and the archivolt over windows have enriched moldings, but are without keys. Circular medallions are relieved on the spandrels over the piers, and they are eventually to contain the sculptured book-plates of great authors. A strongly projecting belt with carved fret on its face separates this story from the upper one. The effect of this story is very dignified, refined and satisfactory, and probably gives the dominant keynote to the character of the building. It has a very evident flavor to the Neo-Grec style, although it is in no sense an imitation of the treatment of the exterior of the Boston Public Library or of that of St. Genevieve, Paris.

The upper story has a very different, and harmonious, treatment of marked Grecian type in its piers and columns. The angle piers have molded bases and richly carved caps, resembling those of Grecian Ante. The intermediate piers are single or coupled



BRONZE TABLET.





GENERAL EXTERIOR VIEW, CHICAGO PUBLIC LIBRARY.



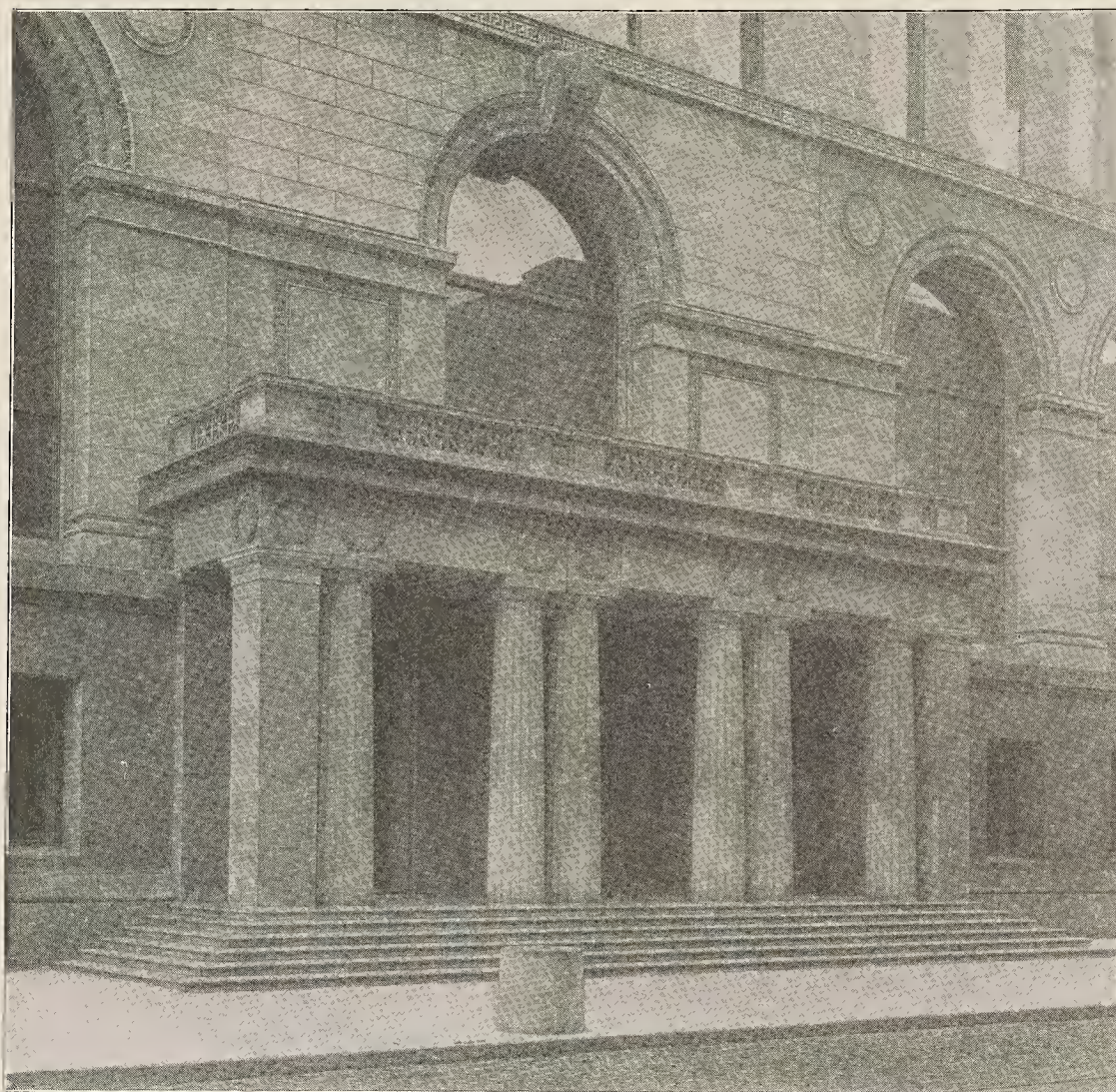
engaged Grecian Ionic columns of the form used in the Erechtheum at Athens.

The entablature is of pronounced Roman character, especially the strongly projecting garlands and lions' heads, sculptured on the frieze over the projections at the angles of the building. These are, indeed, beautifully wrought, but seem heavy and obtrusive, when viewed from the sidewalk below. A plane frieze with an inscription extends along the middle of each façade of the building, and the effect of this is much better than that of the frieze with high reliefs, and it is indeed quite satisfactory. The cornice is supported by moldings, a dentil band, and enriched

out encroaching upon the sidewalk. At the northern end of the building, on Randolph street, a separate entrance was required to the reading and reference rooms as well as to the rooms on the ground floor, where the patent reports, the public documents, the files of newspapers and the literature for the blind are consulted, but principally to afford a convenient access to the G. A. R. rooms on the next floor above, without obstructing the principal entrance to the delivery and reading rooms of the library proper. A beautiful stone porch of very massive character is thrown out before the three doorways. It is composed of columns set in pairs, with pilasters at the angles, and these are treated in the

Grecian Doric style, with flutes, entasis, and the peculiar capitals. The frieze is undivided, being only adorned by laurel wreaths in high relief, delicately carved above each column and pier. An enriched bed molding supports the cornice, and the mutules are likewise omitted. The balustrade of the porch is composed of stone slabs between pedestals, perforated in the familiar angular Grecian forms. The ceiling of the portico is arranged in coffers with a carved molding. Above the portico is an arched opening like those of the windows at either side, but which is unique in having a strongly projecting key-stone, which is to be sculptured as a console. The stone on either side of this arch is at present left rough for sculpture, and it is intended in the near future to put this work in the hands of some eminent sculptor.

The general effect of the exterior is very dignified and harmonious. It first appears to be of a restrained Renaissance character, which is probably due to the entablature of the building, but a careful examination shows that it is affected everywhere by Greek and Neo-Grec forms, which impart to the design its marked character of refined elegance, and produce a result much superior to any that might be obtained by the use of Renaissance forms alone. The ef-



NORTH ENTRANCE, RANDOLPH STREET.

fect of the rectangular windows in the base is much better than arched windows would have been. The beauty of the exterior is apparent to the most superficial observer, but continued and careful study reveals a perfection and refinement of detail and sculpture that is found in very few public buildings.

Since the exterior of the building will most frequently be viewed from the adjacent sidewalks, the architects have wisely taken special and unusual care to decorate the soffits of all openings above the podium by coffers with enriched moldings, executed in the most careful manner. Viewed from below, these surfaces become very prominent and they would not look well if they were without ornamentation.

The end façades of the building are each set back about fifteen feet from the building line of the street, to obtain space for the steps and broad landings before the southern entrance, as well as for the steps and stone portico before the northern entrance, with-

fect of the rectangular windows in the base is much better than arched windows would have been. The beauty of the exterior is apparent to the most superficial observer, but continued and careful study reveals a perfection and refinement of detail and sculpture that is found in very few public buildings.

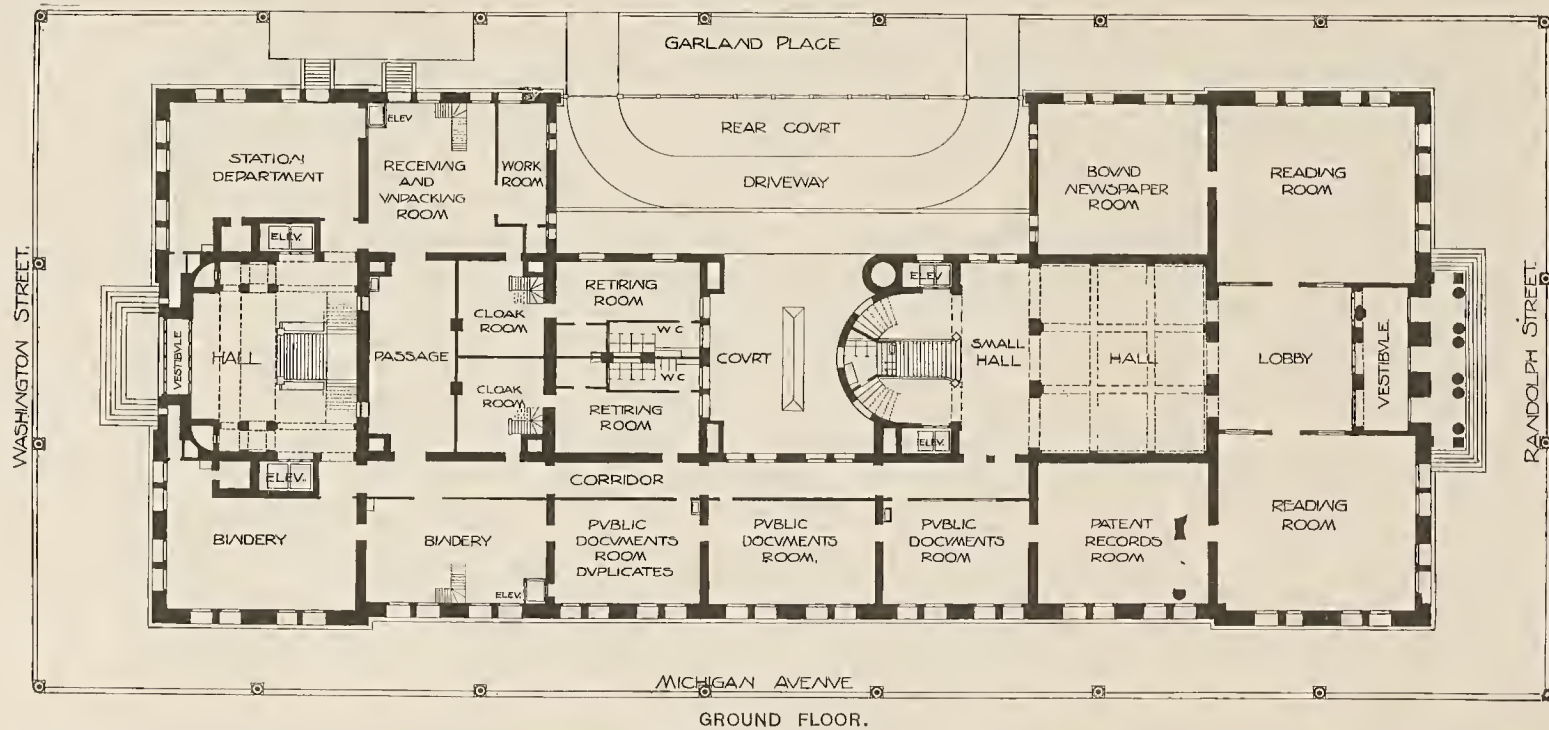
**South Entrance.** The southern entrance, on Washington street, is the chief portal of the building, leading directly to the grand staircase hall, the delivery rooms, and the administrative offices. The middle portion of the façade is recessed about six feet to afford space for a permanent vestibule, and to provide the great and impressive arch over the entrance, whose soffit is decorated by two rows of very richly sculptured coffers. Above the archway projects a balcony, supported by consoles.

The grand entrance archway is worthy of the most careful



study. Its lower portion is occupied by a vestibule with three pairs of external swinging doors of mahogany with glass panels, and with as many pairs of internal doors of wood, covered by dark green leather, studded by bronze nail heads and rosettes, containing oval glass panels. The framework inclosing these

a single long panel containing a magnificent band of Roman scrolls and foliage in high relief. It should not be forgotten that all this metal work, together with that used inside the building, is solid bronze of the best quality, and is not electro-bronzed iron.



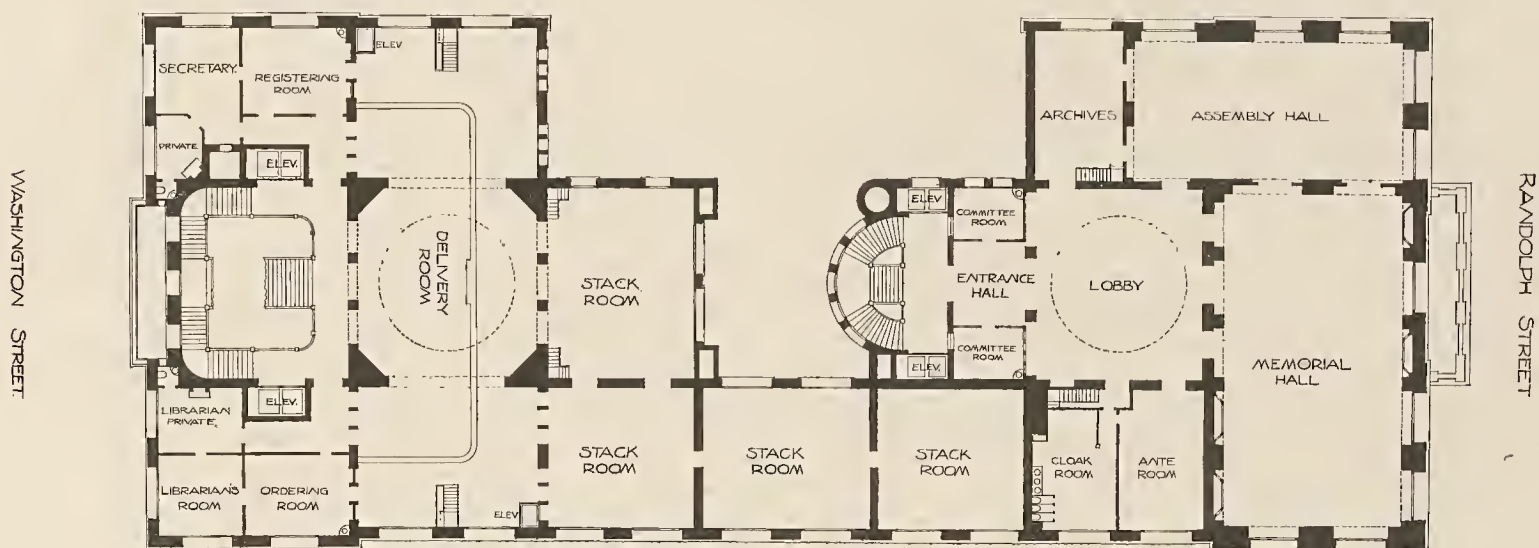
GROUND FLOOR.

doors is of solid statuary bronze covered by delicate and skillfully executed reliefs of original design. Above these outer doors is an equally elaborate bronze entablature, with a cresting composed of dolphins and acanthus leaves. The great round-arched tran-

#### Grand Stairway and Decorations.

In considering the problem of the decoration of the interior of the Library, the Library Board and their architects were confronted with certain conditions which necessarily restricted their choice

GARLAND PLACE

MICHIGAN AVENUE  
DELIVERY, BOOK STACK AND G. A. R. FLOOR.

som above these doorways is subdivided into panels by five vertical and two horizontal massive bronze bars of similar workmanship, whose intersections are accented by delicately sculptured massive bronze studs or rosettes. A transom bar two feet high spans the archway between the transom and doors, is arranged in

of material. The Library is in the heart of the business portion of a great manufacturing city, where bituminous coal is largely used and the air is charged with soot and smoke. It is therefore essential that all decorated surfaces should be so treated that they can be kept clean by the janitors employed in the

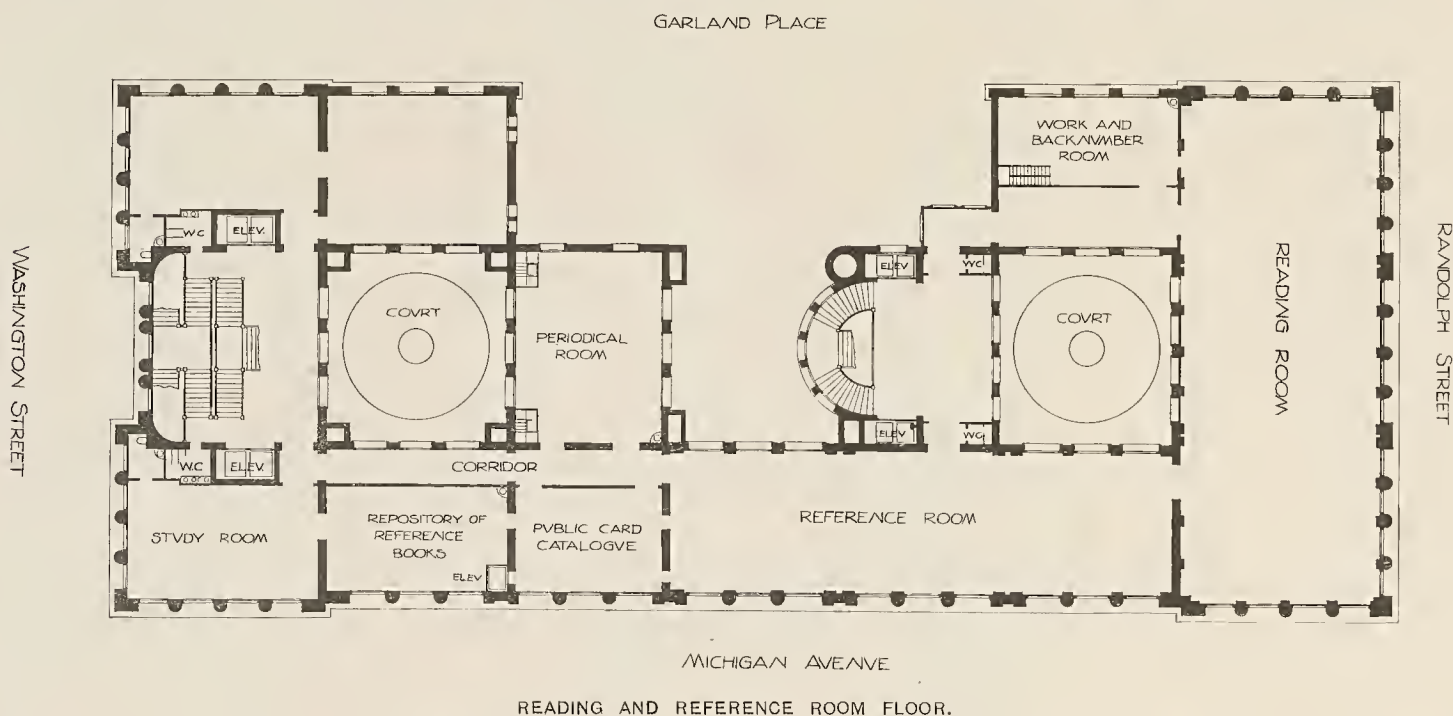


building, and that workmen should be able to renovate and repair all damage done to the painted surfaces, which, of course, would exclude the personal and artistic work of celebrated painters and restrict the decoration to the purely architectural.

To obtain a proper idea of the treatment and arrangement of the interior, it will be best to enter the main southern entrance and ascend the stairs to the delivery room. We first enter the grand staircase hall, which is 45 feet deep and 52 feet wide. Upon the internal walls, on each side of the entrance doorways, are set great solid bronze tablets containing the names of the officers and members of the Library Board, of the librarian, Mr. F. H. Hild; of the secretary, Mr. W. B. Wickersham; of the superintendent, Mr. N. E. Weydert, and of the architects, Messrs. Shepley, Runtan & Coolidge. The lettering is very refined and pleasing, and is of original character. The panels are bordered by enriched

patterns, producing an effect of white and pale green. These mosaics are often purposely set on splayed surfaces, and have slight irregularities in surface to increase their brilliancy, when viewed under the electric lights. The patterns at first appear similar, but examination reveals an infinite variety of details.

A massive elliptical arch, thirty-four feet long, spans the middle of the hall between two piers, and supports the two branches of the upper staircase. The sides of this arch are composed of actual marble voussoirs eight inches thick, which are radially jointed and materially assist the steel framework in carrying its load, and moreover impart to the architrave a character of massive strength and durability. The soffit of this arch is paneled in glass mosaic, the Y-emblem of Chicago being set in the middle panel, while the laurel-wreathed names of three great American authors are placed on each side in alternating panels.



moldings. Near them, in the side corridors, are placed two large bronze grill doors, which give access to the electric cut-outs, each door being divided into three panels in a very beautiful perforated design.

Four elevators run to the upper floor, and they are inclosed by bronze grills of unique design and pleasing execution. On the left hand is the station and receiving departments, on the right is the bindery, and the entrance to a long corridor, leading to the northern halls and stairway, giving direct access to the rooms for documents, patents, newspaper files, and the two reading rooms connected therewith. This corridor and the adjacent rooms mostly have mosaic or tiled floors, with marble wainscoting. The walls are colored a soft green, and the ceilings are a dull olive brown.

Returning to the grand stairway, we find its mosaic floor to be composed of light and dark green marble, the latter arranged in a unique linear pattern, and a great bronze relief of the seal of the city of Chicago is embedded at its center, in front of the staircase. Looking upward, a very light and brilliant color effect in white and green is observed, produced by the use of nearly white statuary Carrara marble on all surfaces, walls, steps, balustrades and soffits, illuminated everywhere by sparkling inlays and panels of glass mosaics, composed of geometrical bits of favrile glass, mother of pearl and shells, set in endlessly varied linear

At each side of the lower staircase is placed a wide marble seat of Florentine type. In the rear wall on the first landing are arched windows filled by bronze grills, which are inclosed by beveled bands of glass mosaic. The marble newels at the foot of the stairs are of very simple form, but have beautiful rosettes of glass mosaic inlaid on their sides and top. The fine mosaic ceilings of the side halls next the elevators should be examined.

On the first landing may be seen a series of six windows arranged in pairs in the marble walls, and filled with bronze grills, inclosed by the beveled architraves of glass mosaic, similar to those already mentioned, but in varied designs. These impart the required æsthetic finish to the otherwise plain wall.

The steps are very easy, with 6-inch rise and 14-inch tread; they are arranged in short flights to give direct access to each one of the five stories in this portion of the building, and they are easily ascended. The balustrade railings of the stairs are solid, and their sides are divided into panels adorned by lines of inlaid glass mosaic, with alternating field ornaments of two distinct types, each having an 8-inch central disk of richly figured dark-green Irish Connemara marble. The soffits beneath the different branches of the staircase are likewise covered by panels of glass mosaic, these designs being arranged in accordance with the conspicuousness of the surfaces.

Inside the great southern archway and window is arranged a





VIEW, SECOND FLOOR APPROACH OF GRAND STAIRWAY TO DELIVERY ROOM.

broad marble arch six feet in width, its soffit ornamented by panels in glass mosaic of alternately square and rectangular form, containing the names of the six most eminent Greek and Roman authors. This arch supports the duplex marble stairs to the reading room floor, and its face is covered by 12-inch hexagonal marble slabs of slightly varied hues, thus solving the difficulties of jointing the marble on this surface. From the reading-room

floor iron stairs of simple classical design, colored yellowish green and gold, lead to the upper floor.

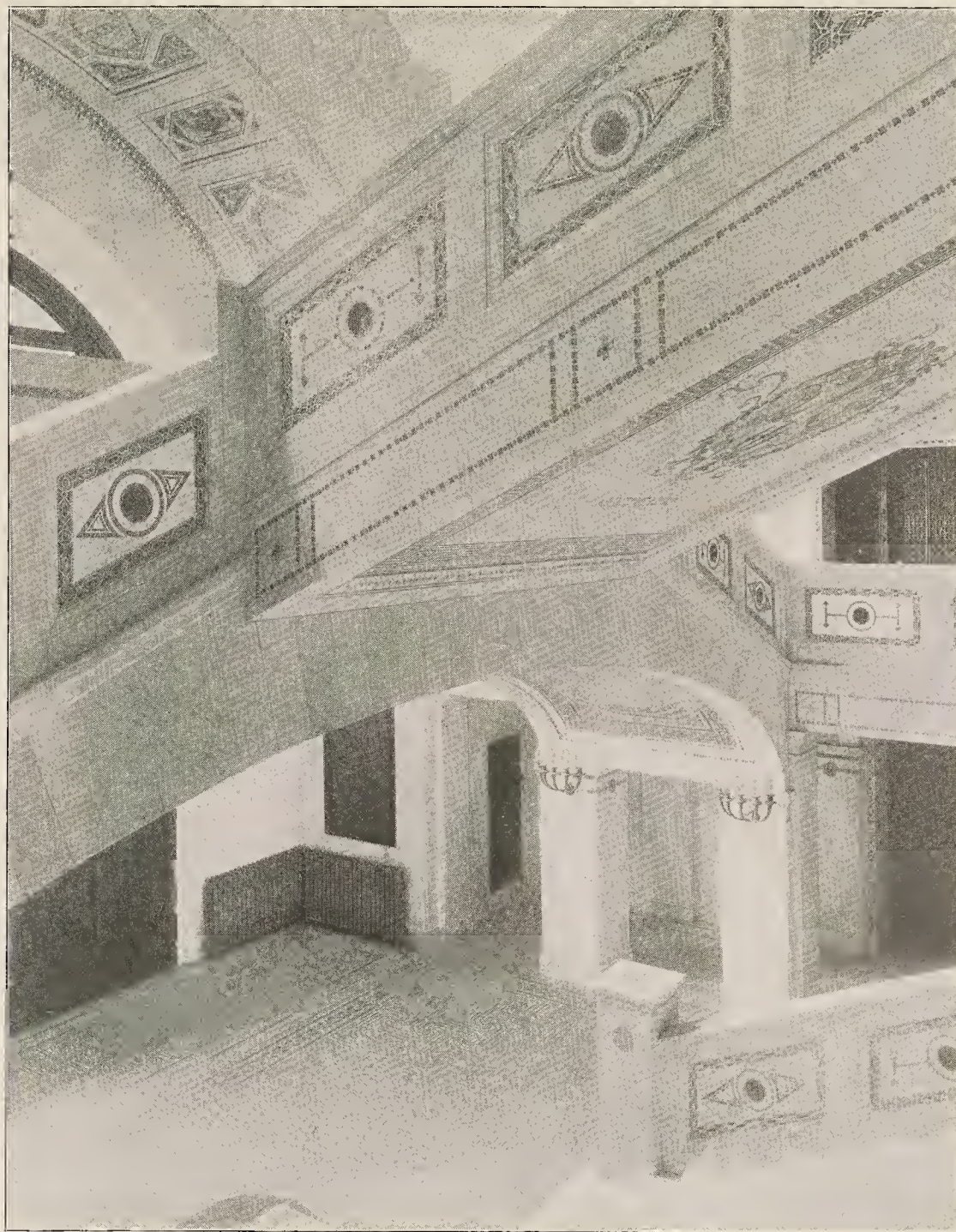
The ceiling of the stairway hall in this upper story is subdivided into panels of three alternating forms, inclosed by enriched moldings, and is decorated in dull yellow, gold, light and dark green, very cleverly and effectively combined. Owing to the low height of the upper story, with which this ceiling must harmonize, the



depth of its relief could only be small, so that its effect is not as impressive and interesting as would be required to popularly harmonize it with the magnificent interior of the staircase hall; but from the arrangement of the stairs this ceiling can be but partially viewed from below, and thus it scarcely participates in the general internal effect. It is surpassed in design and interest by the very

The glory of the grand staircase is found in the portion adjacent to the delivery room. The walls are of Carrara marble with inlaid lines of glass mosaic, with a frieze of the same mosaic above fully six feet high, and divided from the marble walls by extending the beveled cap of the piers with its mosaic band entirely around the room.

On the outer side this deep frieze abuts against the upper stairways, and it properly bears at its center a tablet, commemorating Franklin as the founder of the circulating library. Eight similar and smaller panels contain each four names of famous American and English writers. The panels have rich mosaic borders composed of anthenion and scroll forms, happily combined. This frieze also contains four quotations from the writings of Victor Hugo, Milton, Bacon and Barrows, executed in large letters, very apt in meaning, and thoroughly harmonized with the general effect. The ceiling of this portion of the hall forms the fourth floor, and it is divided into thirty-two coffers richly ornamented by classic decoration, colored dull yellow, light and dark green, and enriched by gilding. This treatment unites the staircase hall with the delivery room and is more satisfactory than the colder and more formal effect within the stair hall of the Boston Public Library. It is true that the numerous flights of stairs give a crowded effect to this stairway, from some points of view. A larger area should have been primarily assigned to this room, to permit a more open treatment and a better general view of the interior essential to the proper monumental effect. This might have been secured by omitting the broad stone landing outside the southern entrance, and extending the southern façade nearer the building line of the street. But with the prescribed limited dimensions of the hall and the requirement of convenient access to each of the five stories in this part of the building, it is certain that the architects have produced the greatest possible æsthetic effect in the interior, concealing the difficulties and giving to the whole an expression of high refinement, lovely coloring



DETAIL VIEW OF GRAND STAIRWAY, SHOWING BRIDGE AND MOSAIC TREATMENT

effective and ingenious ceiling of the northern semi-circular stairway hall. The best points of view for this magnificent stairway hall are from the entrance, and especially from the angles of the balustrade next the delivery room, where the great marble arch over the entrance and the marble stairs and the internal walls, together with the ceiling over the stairway next the delivery room, combine and produce a very noble effect.

and brilliant effect, rarely seen in public buildings.

#### Delivery Room.

The delivery room is entered directly from the grand staircase by three large open archways, separated by two massive white marble piers, four feet square, connected by marble arches whose spandrels are filled with glass mosaics. A similar triple archway at the rear of the delivery room opens into the stack room, affording a glimpse of the two





DETAIL EXTERIOR OF BUILDING.



middle stories of the metal stacks with paneled fronts, all in dark green and gold. The delivery room extends across the entire width of the building, with two great windows at each end, and is 48 by 134 feet. Four great marble piers are set at the corners of its center square, and these are connected by transverse elliptical arches of marble, whose lines are repeated over the triple arcades on the other two sides by mosaic bands.



BRONZE WINDOW GRILLS, MAIN STAIRWAY.

The surfaces above these arches are curved inward and support a large dome of richly colored glass, thirty-eight feet in diameter. Around its base is inscribed the appropriate quotation from Addison: "Books are the legacies that a great genius leaves to mankind, which are delivered down from generation to generation, as presents to the posterity of those who are yet unborn." The internal surface of the dome is subdivided into panels by

decorated meridian and horizontal ribs of bronze, the panels being filled with colored glass set in bronze grills. The crown of the dome is filled by emblems in richly colored stained glass. To prevent all drip from condensation of moisture, this dome is inclosed by a much larger external glass dome, and the space between the two is warmed.

A great band of glass mosaics fills the space between the arches and the base of the dome. Colored rosettes with simple emblems are set above the angle piers, and from these duplex mosaic scrolls of exquisite design extend and fill the spaces above the arches. The wings of the delivery rooms are likewise wainscoted in white Carrara marble, above which, excepting at the end, extends a deep frieze of glass mosaic like that in the adjoining staircase hall, but which contains large panels of green serpentine marble, inlaid with white inscriptions in ten different languages, from Egyptian hieroglyphics to modern characters. These have borders of varied design, and the remainder of the frieze is filled by effective designs in mosaic. The ceiling of each wing is divided in nine rectangles by beams of two different depths. Each rectangle is then subdivided into six coffers with suspended central flowers and enriched moldings, which are chiefly in subdued creamy tints, with suggestions of light to deep green in metallic lustrous colors, which harmonize the ceiling with the prevailing green effect of the mosaic ornamentation.

The woodwork in this room is *prima vera* or white mahogany of massive and dignified design, with graceful carving. The delivery counter and railing should be particularly noticed, since its entire front is not paneled in any way, but extends in an unbroken surface. It is covered by vertical veneers opened out and applied in such a way as to regularly repeat the patterns of the beautifully grained wood. Great difficulties must have been found in the execution of this beautiful work. Tables with bound finding lists of books are placed in each room, with table lights and unique seats, for the use of those selecting books. These tables are of Roman type, having solid wooden ends delicately carved. The entire floor of the delivery room is of white and green marble mosaic in elegant design.

The grand staircase hall and delivery room are treated in the same bright and sparkling manner with lavish use of white marble and of mosaics of marble and glass, together composing the richest and most highly decorative portions of the building. This is properly the case, for these rooms will be most frequently visited and used by the people, to whom this library will forever be a peculiar and priceless possession, not merely for the literary advantages offered, but as a ministration to that love of beautiful forms and colors, which is not a monopoly of the rich and cultured few, but is the right and possession of the many.

The mosaics employed in the decoration of this building exceed in area, beauty and cost, those to be found in any building erected since the fourteenth century, and the glass mosaics, in particular, may justly be assumed to fully equal, in beauty of design and harmonious effect, any similar art works belonging to the best periods and eras of art. The floors, walls and ceilings of the grand stairway and delivery room being in direct communication with the soot-laden outside air through the main entrance, it was partially necessary that the decorations should be of a most permanent and indestructible character.

**Stack Rooms.** Four large stack rooms for the storage of books are located next to the delivery room. Two of these rooms are equipped with three decks of book stacks of iron and steel construction with opaque glass floors. Each story is about 7 feet 6 inches in height and the middle deck is on a level with the floor of the delivery room. In this deck are shelved about seventy-five per cent of the books most called for



in the circulating department, and it was not found necessary to have mechanical appliances to carry books to the issuing counter. Electric book lifts are used to transmit books from one deck to the other and from the stack rooms to the reference room which is located on the floor above. On the reference-room floor is also located a three-story stack for the storage of bound periodicals, a department in which the library is very rich.

Connecting the receiving desk in the delivery room with the delivery stations department on the ground floor are three means of communication—pneumatic tubes, speaking tubes and telephone. Two service elevators are used to carry books from the stack rooms to the delivery stations department and to the bindery. These elevators are also used by the attendants on duty in going to and from the departments on the various floors. A perfect system of telephone installation, comprising a switch-board and twenty-four instruments, insures rapid communication between the various departments of the library. Twenty-six electric clocks controlled by a master clock in the engine room are conveniently placed in various parts of the building.

**North Entrance.** The northern entrance is used by those going directly to the reading and reference rooms, required for the separate and the G. A. R. organizations, whose rooms are on the next floor above. Three doorways with double outer doors, paneled in dark mahogany and very lavishly carved, set in bronze frames, with inner doors of dark green leather decorated by bronze nails, give access to the vestibule. Its walls are covered by green-veined white Vermont marble, and the openings have paneled marble soffits, jambs, and broad



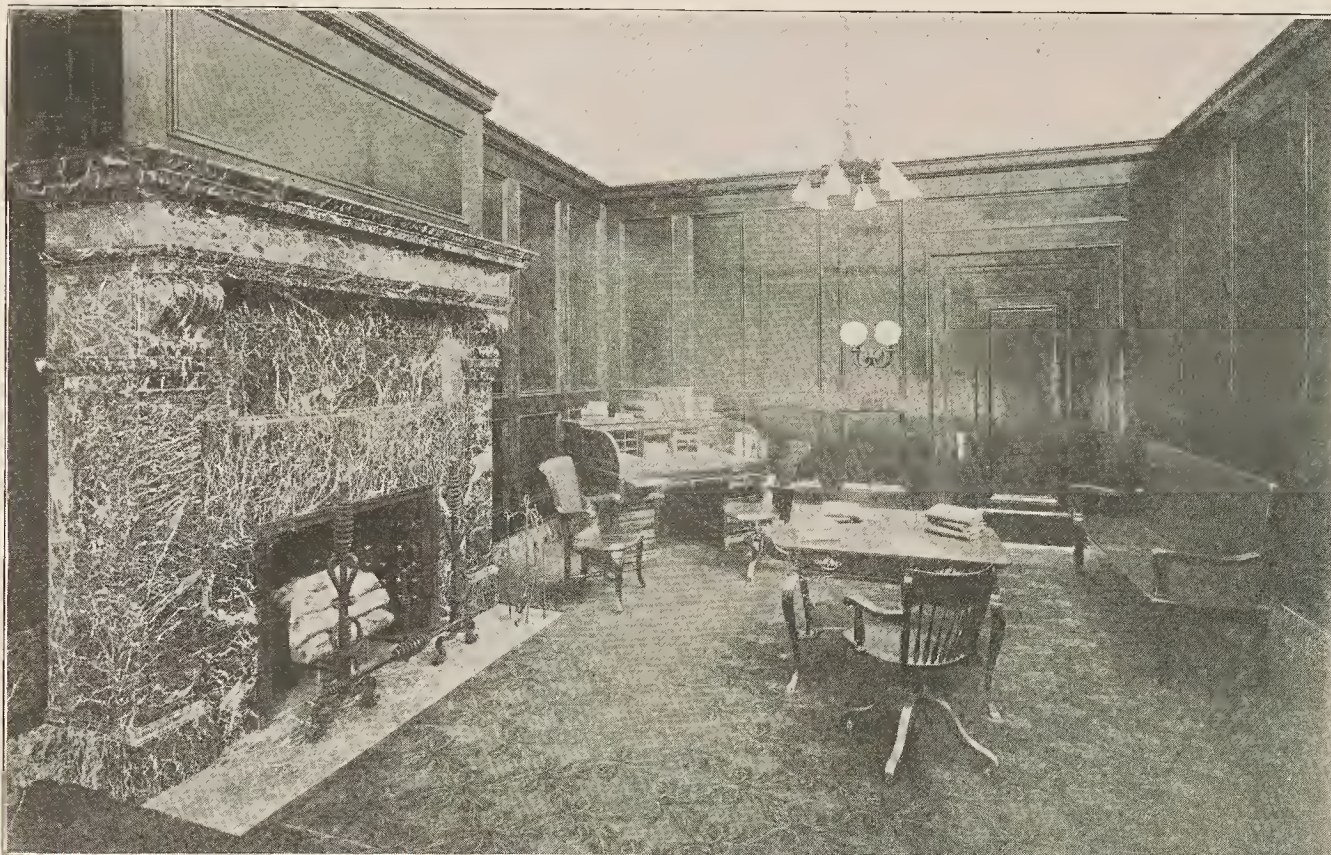
DETAIL OF TABLES IN REFERENCE ROOM.

architraves. The ceiling is divided by two deep beams, each division being subdivided into eight coffers. The entire ceiling is fully ornamented in a Grecian style, and is colored a dull olive-yellow and gold.

Openings between massive marble piers lead to a lobby, the structural lines of which are in pink Knoxville marble, surrounding panels of veined Carrara—thus forming a transition from the white of the vestibule to the pink of the staircase. Its ceiling is divided into nine rectangles by deep beams, whose ends rest on

marble pilasters of Doric type, each having a shaft of a single slab, five inches thick. The eggs alone of the cap molding are polished, producing a sparkling effect. The ceiling is treated like that of the lobby, excepting that a bronze grill and frame with glass tiles is set in each panel, to introduce light from the G. A. R. lobby, and dome immediately above.

The stair hall contains two large marble piers, which, as well as its walls, are lined with variegated marble, quite remarkable in its character.



PRIVATE ROOM OF FREDERICK H. HILD, LIBRARIAN.



Its ceiling is divided into twenty-seven panels, decorated by the same combination of Greek forms and moldings, and painted in the same tones of dull olive-yellow and gold.

All these rooms are floored with tesserae or small tiles of light brown and deep red, arranged in wide borders and sprinkled panels.

The general effect of these halls is very massive and imposing, although it lacks the lightness and brilliancy of the southern staircase hall, being intended to produce a dignified effect with a much smaller expenditure.

Four elevators run to the upper floor, and connect directly with the great reference and reading rooms. Pink Tennessee marble

colored with a pale red ground, brownish yellow, and cream and gold moldings, to harmonize with the pink marble walls, so that it is much more effective and pleasing than is the uppermost ceiling of the grand southern stairway.

**G. A. R. Rooms.** Returning to the G. A. R. rooms, we first enter a great lobby 45 by 50 feet, lighted by a glass dome without pendentives, but with coffered angles beneath the dome. The dome consists of stained glass in beautiful Renaissance designs, and the walls are lined with marble, the interior having an imposing but rather solemn effect.

The Memorial Hall is 53 by 96 feet, and is 33 feet high. It is entered directly from the lobby through three doorways, and has



GENERAL VIEW OF REFERENCE ROOM.

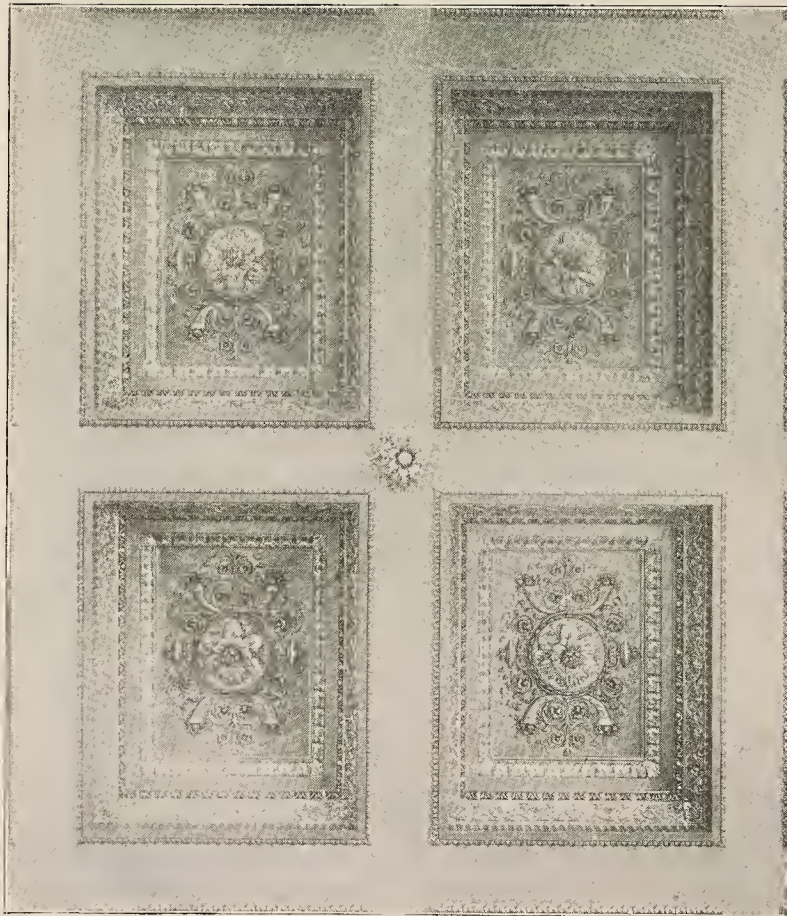
is used for the walls and for most ceilings of the northern stairway, as well as for the steps, but bronze balustrades of richly ornamented Renaissance character are employed, instead of a solid marble railing. The soffits beneath the stairs are covered by simple mosaics in cream, red and black marble.

The ceiling of the upper story of this staircase hall is very elaborate and interesting, and deserves to be carefully examined. It is divided by two equi-distant beams cutting across the semi-circular outer portions, and a single cross-beam cuts off three equal rectangular spaces on the other side, each divided into eight coffered. The remaining portion consists of three spaces of irregular form, but they are paneled with great ingenuity, and the whole is very richly decorated by crisply executed modeling, then being

a very imposing interior. Its walls are composed of great piers and deep recesses, all in verd antique marble. In the tympanum of each recess is set a shell with a pedestal, to receive the portrait busts of the most distinguished commanders of the Civil War. The ceiling is divided into bays by massive beams, between which a peculiar system of paneling is introduced which is striking and unique, though perhaps not quite in keeping with the impressive internal effect. This room is intended to contain a collection of mementos of the Civil War.

Adjoining the end of this hall is the assembly hall for meetings, which is much more simply treated, its lower walls being a deep red, the upper walls and ceilings being colored buff, yellow and brown. Gilded inscriptions commemorate the principal





DETAIL OF CEILING IN READING ROOM.

Union victories. Adjoining these rooms are executive, committee and cloak rooms, arranged on two floors. A full regiment of soldiers may be stationed as a guard of honor between the street entrance and the Memorial Hall.

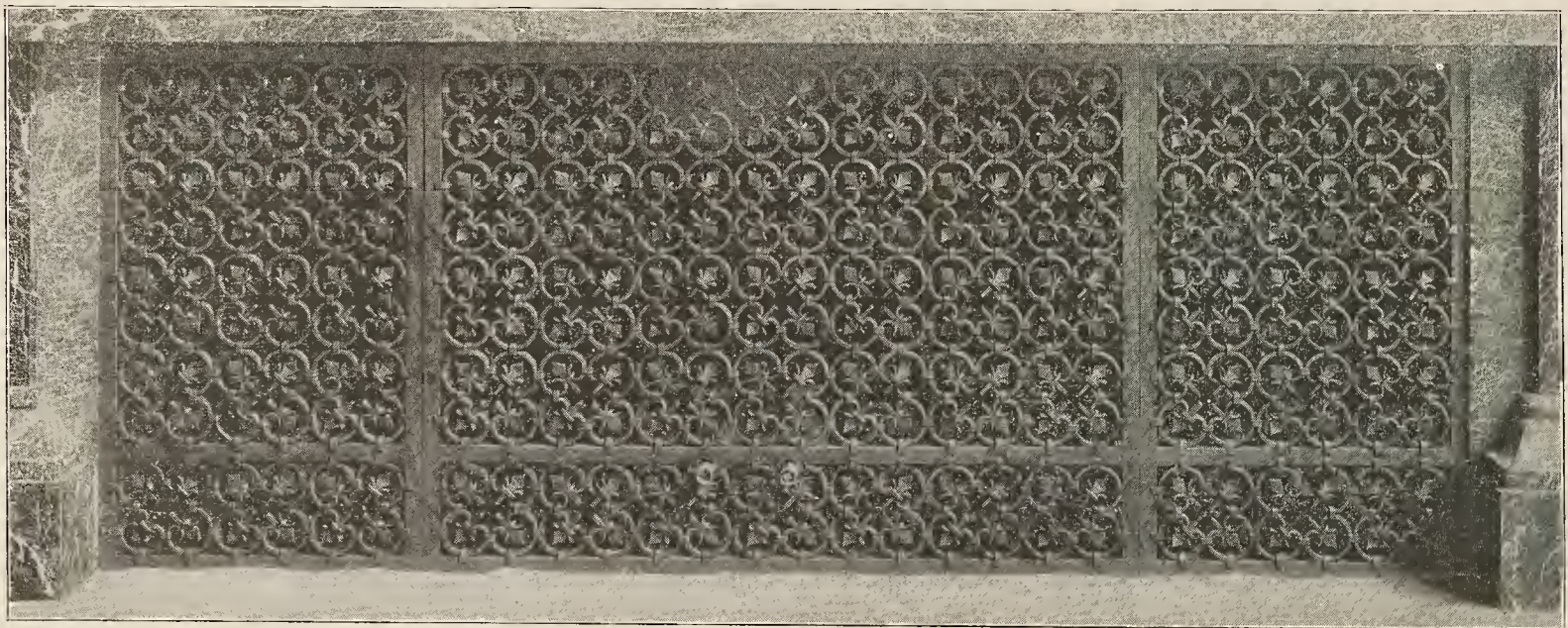
These G. A. R. rooms occupy a total floor area of 16,000 square feet, and will revert to library uses after a term of years, with the exception of the Memorial Hall, which is assigned for that pur-

pose in perpetuity. It is to be regretted that these rooms were necessarily included within the building, since the problem was thereby made much more difficult, and the design and arrangement of the library might have otherwise been developed with greater freedom, and probably with a single entrance on the avenue, making that the principal façade; but simple problems in design are rarely found, excepting in the architectural schools.

**Reference Room.** The reference and periodical reading rooms may be reached from either entrance, though they are arranged on the upper floor of the northern portion of the building. Adjoining the reference room on the south is the public card catalogue room, with its case of five hundred drawers, with a capacity for half a million cards.

The reference room is 38 by 138 feet and is 30 feet high. It has a maple floor, covered with cork carpet, and wainscoting of Siena marble. Its length is skillfully divided in three parts by coupled Grecian pilasters at each side, supporting massive coupled transverse girders. Since the bookcases are arranged along the inner walls, this produces two quite different heights of the window sills along the sides of the room. Single Greek pilasters are set between the windows of the outer wall, and shorter pilasters with Greek Ionic capitals of peculiar type are placed between those of the inner walls, thus happily disposing of this difficulty. The ceiling over each portion of the room is then divided into nine equal parts, each part being finally subdivided into nine deep coffers. The decoration is everywhere purely Grecian, the molding and forms being copied from the best existing examples. There are three great double doorways in this room, treated very like the principal entrance of the Erechtheum at Athens, excepting that the frieze is here decorated by upright and reversed honeysuckle ornaments.

On entering this room, the general impression of a dull, brownish yellow color on the walls and ceiling is produced, similar to that assumed by Pentelica marble after years of exposure. But the architraves of the doorways show varied and harmonious colorings in soft bronze or metallic lusters, and a careful examination reveals the same coloring everywhere, and especially on the ceiling. It is a very skillful and successful attempt to apply color to architectural forms, just as a Greek architect would have done under similar conditions. The furniture of the room is of



WROUGHT-IRON GRILL IN READING ROOM.





GENERAL VIEW OF G. A. R. MEMORIAL HALL.

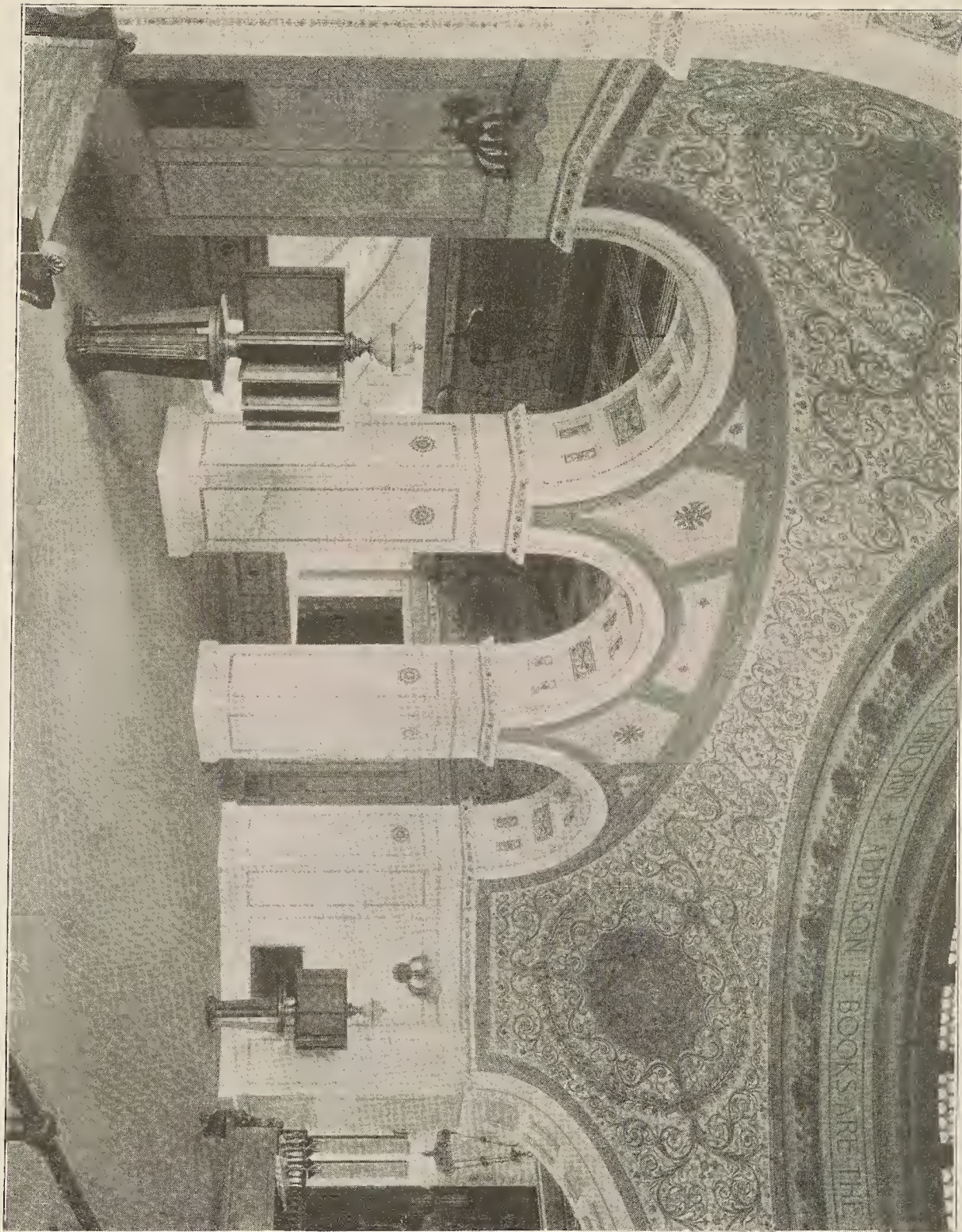
oak in natural color. The tables are about 5 by 12 feet, with eight sittings each, and are arranged with aisles of generous width.

**Reading Room.** The great reading room adjoins the reference room, is 55 by 142 feet, occupying the entire northern end of the upper floor. It has a seating capacity for four hundred readers of periodicals, mostly at tables of simpler design, finished in antique oak. Its length is also divided into three parts by coupled pilasters supporting coupled girders. Single intermediate pilasters are set between the great windows. A frieze, ornamented by garlands and masks in high relief, extends around the room above the pilasters, and the ceiling of each portion is subdivided into twenty-four very deep and large coffers, boldly decorated by reliefs and by enriched moldings. The wainscoting is of verd antique marble, in which are set wrought-iron screens, of fine design, covering the radiators. The pilasters are paneled with the Renaissance designs in high relief, which have a matted gold effect, relieved by a dull green ground. The walls are painted a very dark and rich red. The color tone of the ceiling is a dull olive-green, heightened by dull bronze and bright colors, which accent the sculpture. With the

exception of the doorways, which are taken from the doors in the Palazzo Vecchio in Florence, the general form and color treatment of this room is based on that of an assembly hall in the Doge's palace in Venice. The color effect seems rather too strong for most Americans who have not seen Italian interiors, but it is well executed, and when softened by time will be thoroughly appreciated, as it deserves to be.

**Ventilation, Electric Lighting and Machinery.** Incandescent electric lamps are used throughout for lighting, being well distributed for use and effect, with table lights for readers, and bracket and pendent fixtures designed to illumine with their radiant effulgence the deep coffers of the ceiling, which are enriched with ornate moldings, stars and rosettes, gilded and gorgeously decorated with harmonious colors, vying with the starry blue mantle of heaven and the emerald garb of meadows spreading in the golden sunlight. Diffused by the lofty ceiling, scattered in myriads of scintillations from thousands of coruscant tesserae of mother of pearl, gold and glass, wrought into fanciful arabesques and significant emblems, and mingled with the side lights of the semi-translucent marble of Carrara, the subtle, blended, soothing radiance of reflected light gently flits





VIEW IN ROTUNDA OF DELIVERY ROOM, LOOKING SOUTH.



downward and fills the imagination of the visitor with wonder and fascination.

Yet these lights, in dazzling array, seven thousand or more incandescent and twenty-six arc lamps, whether arranged in clusters of bulbs in cup-shaped opalescent iridescent leaded glass baskets held by antique bronze trigonal anses, or disposed on exquisitely wrought cornucopias of wall brackets, or inclosed in leaded glass globes of bronze lamp standards, which on massive granite pedestals will encompass the building like a gilt picture frame, are but flowers and leaves sprouting and budding on the manifold ramifications of a tree, of which the trunk is deeply rooted in the sub-basement.

The visitor in quest of information will, therefore, wend his way to these devious subterranean precincts. Surrounded by walls recalling to the mind Cyclopean structures built to stand for ages, he will be struck with amazement at the view of the overwhelming multiplicity and profusion of pipes and tubes of every description; electric cables and iron-armored conduits, pipes for compressed air, steam pipes, water pipes of every description with here and there a water or air tank interspersed, or the picture enlivened by machinery in operation. And the most astounding vision of all — bounding, vaulting, intersecting, contorted, intertwined, intertwined and entangled, like gigantic serpents struck dead in their abode after a titanic internecine struggle — behold the enormous sheet-iron ventilating ducts. Through these ducts 8,000,000 cubic feet of air are removed from the building per hour by means of seven exhaust fans, while seven force fans supply 7,600,000 cubic feet of fresh air per hour. The air is forced into each room near the ceiling,



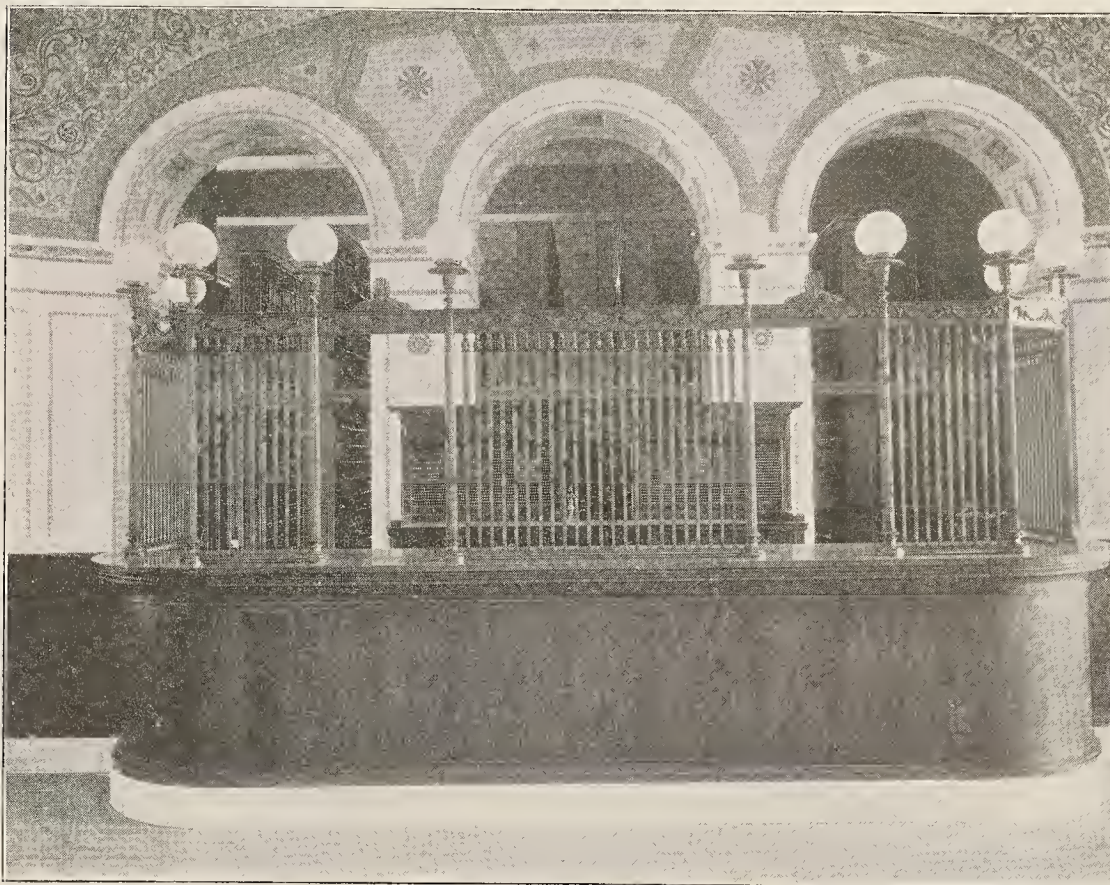
DETAIL OF TABLES AND NEWSPAPER DESKS, READING ROOM.

and removed near the floor. The registers aggregate in net area 443 square feet. The consumption of electric current in the fourteen fans is equivalent to 38 horse-power. The fresh air, after entering the inlets, passes over tempering coils, which, in cold weather, are filled with high-pressure steam for taking the chill off the air. It then enters a copper-lined chamber, in which it must pass through a spray of fresh water, projecting the impurities it may contain against impinging surfaces, where they are washed away. After leaving the washing chamber, the air may pass over indirect heating coils or by-pass the same, as may be desired. The total heating surface of these indirect coils amounts to 18,000 square feet.

The fans with the ducts supplying and removing air are so arranged that such departments of the library as close at different hours are kept separate, and the respective fans can be shut down when the corresponding departments are closed at night, while others are still running.

In conjunction with the Indirect System, which alone is sufficient for heating the building in mild weather, a direct heating system has been installed with radiators of an aggregate heating surface amounting to 30,000 square feet, disposed principally along and under the windows of the outside walls.

Both the indirect coils and the radiators are connected by a system of small pipes to air exhausters



DELIVERY DESK IN DELIVERY ROOM — BRONZE GRILLS.  
(See pages 22 and 29.)



near the engine room in the center of the basement. In this room electric current is generated by ten dynamos of a total capacity of 530 kilowatts. The electric generators are directly connected to the crank shafts of the five engines, one at each end of the shafts. A total of 875 horse-power is represented in these engines. The four larger ones are cross-compound. They are guaranteed to produce an electrical horse-power at the switchboard for every  $25\frac{1}{4}$  pounds of steam consumed by them. The smaller engine is steeple-compound, and is expected to develop an electrical horse-power with  $26\frac{3}{4}$  pounds of steam per hour.

Considering its size, the switchboard occupies a high rank among its kind in the country. It is divided into three panels, of which the central one is devoted exclusively to generator circuits and instruments, while the panels at either side are appropriated to the light and power circuit.

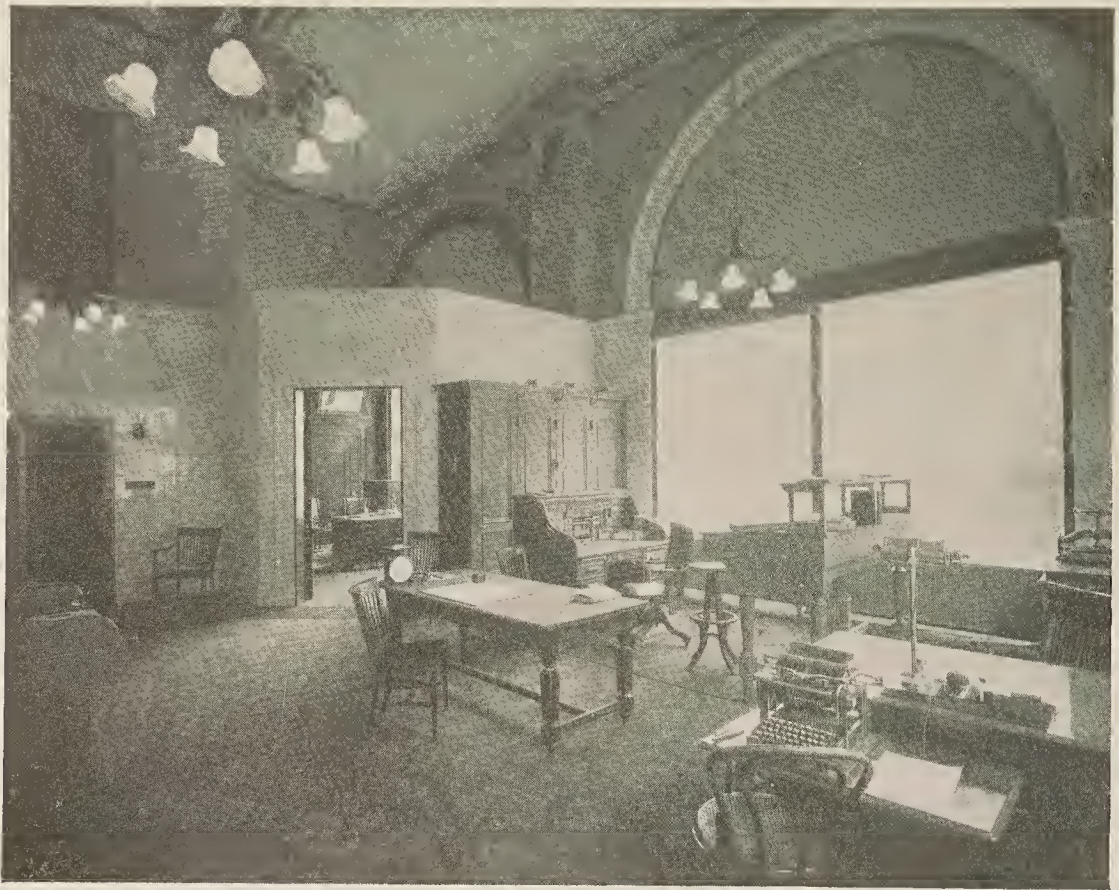
From the switchboard large cables distribute current for power as well as light throughout the institution.

Aside from the power consumed by the motors driving the ventilating fans, current is supplied for operating ten elevators to motors of a total of 255 horse-power, and to six book elevators. Current is also supplied for

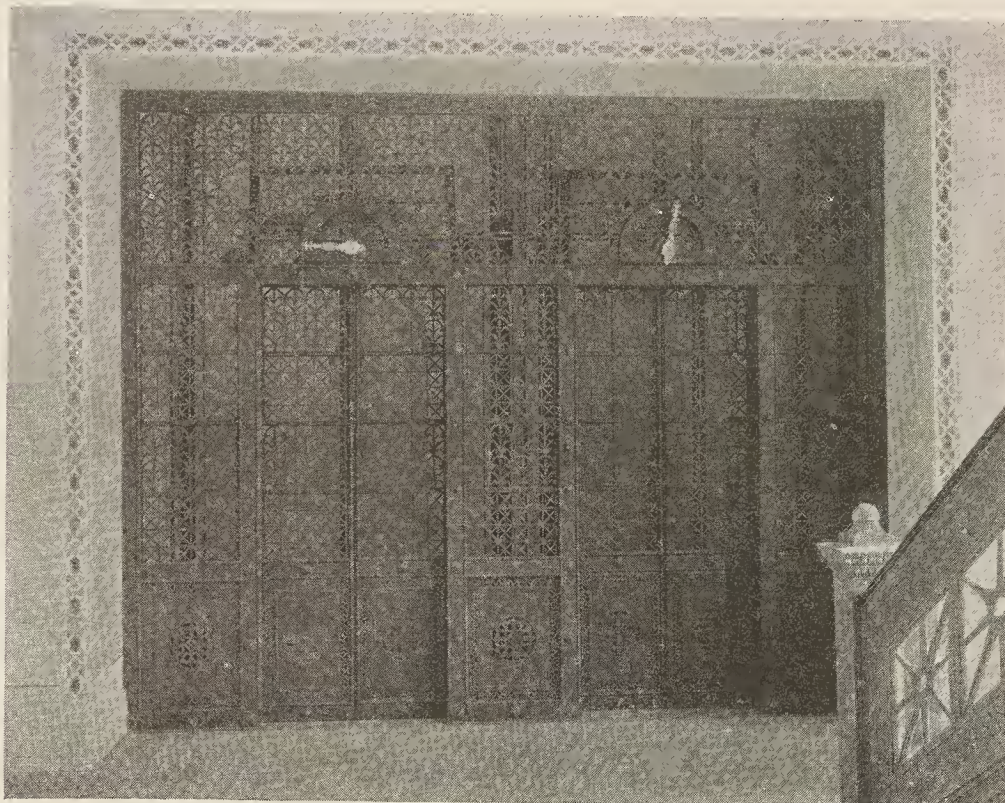
two electric pumps, one for house service, and one for boiler feeding, and for various other purposes, such as coal and ash handling machinery, telephone service, electric cooking apparatus in the employes rooms, etc.

Aside from the steam that is required for the engines and the heating of the building, steam power is used directly for three boiler feed pumps and injector, small pumps for returning condensed water to the boilers, two fire pumps, each capable of discharging 750 gallons of water per minute, two steam siphons and two pairs of air compressors. One pair of air compressors is used for automatically opening and closing the elevator doors. The other set furnishes the compressed air for lifting the drainage water into the street sewer by means of ejectors placed in a pit at a depth of twenty-nine feet below the sidewalk. The fire pumps will supply water for the fire hose located on the inside of the building, and also for a system of pipes planned to envelop with a curtain of water the walls and windows of the building for protection in case of a fire across the alley. The steam is generated in a boiler plant consisting of three larger and one smaller units with an aggregate heating surface of 8,500 square feet, equivalent to about 850 horse-power.

The coal is brought to bunkers and bins in the boiler room by means of conveyors. The ashes are hoisted to the level of the rear

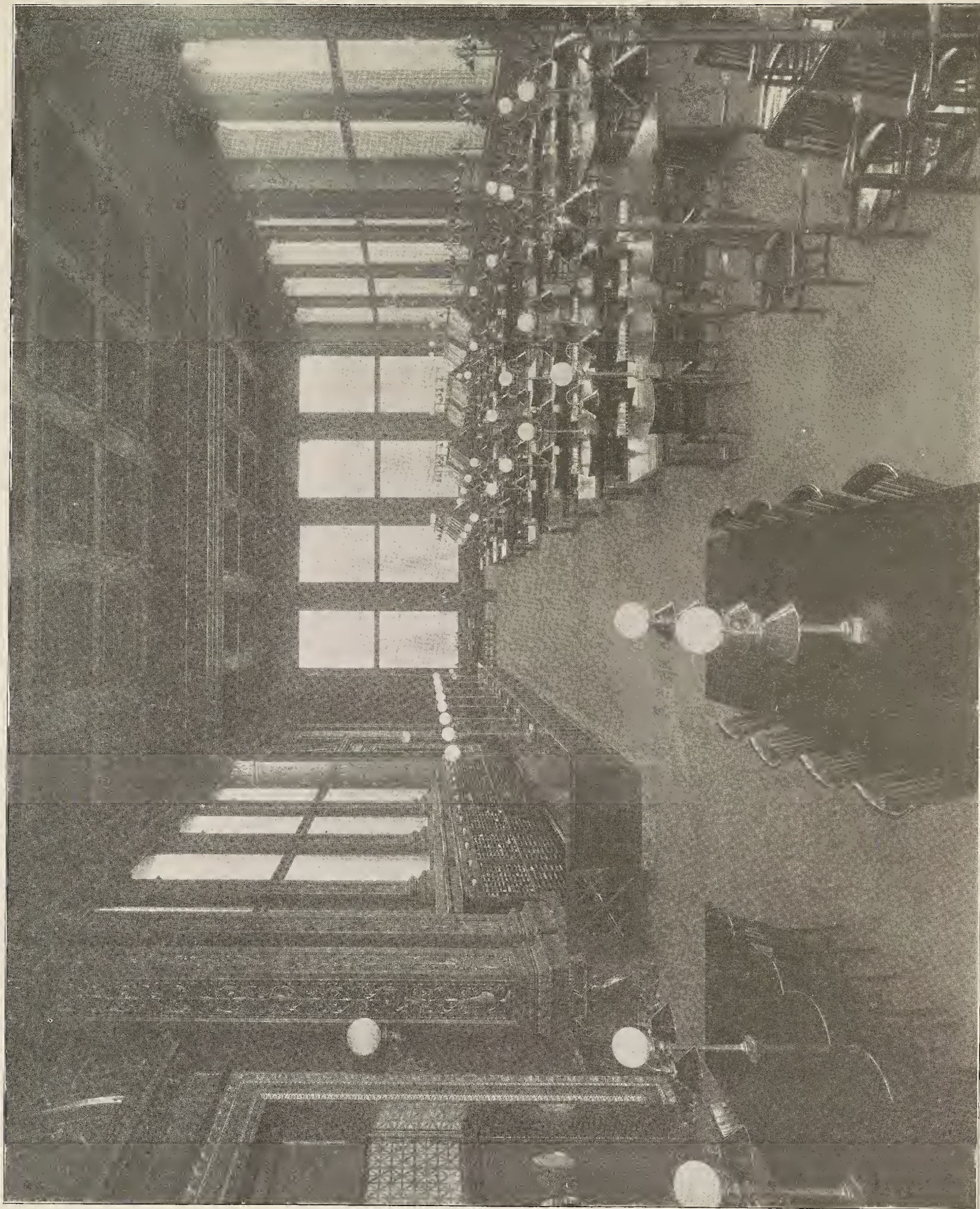


PRIVATE AND GENERAL OFFICES OF THE SECRETARY.



BRONZE ELEVATOR ENCLOSURES, MAIN ENTRANCE.  
(See page 22.)





GENERAL VIEW OF READING ROOM.



court by means of a bucket elevator. Coal storage has been provided in a vault under the rear court for thirty days in case of the emergency of a coal famine.

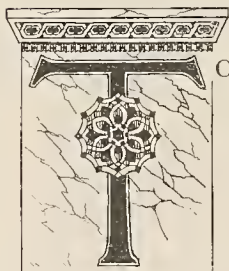
The proposed installation of accumulator batteries will make the electric and power plant of the Public Library one of the most complete, as well as best equipped, installations in large public buildings of the Western country.

A system of electric clocks signals the fleeting hour simultaneously in the various rooms of the building to the employees, the visitors and the studious readers.

Both time and space are lacking for a complete description of this great building, but the most interesting parts have been mentioned. As a library building it is planned with especial regard

to the convenience of the public and to due economy in administration. Ample provision is further made for an increase in the number of books up to 2,000,000 volumes. As an architectural monument it must take very high rank among American buildings, and it is probably the building in Chicago which will be found of greatest interest to visitors. Its slight æsthetic defects have been frankly mentioned, and they are not to be charged to the accomplished architects, but to the stringent limitations imposed by the conditions of the complex problem. Chicago deserves full credit for the generous provision made for the intellectual benefit of its people, and for its satisfactory completion of this monument of the public spirit and culture of its citizens, and so, good people, enjoy the feast that is prepared for you.

## THE CONSTRUCTION IN DETAIL.



Those who desire to obtain a full understanding of the detailed work of construction and the materials and systems used in this magnificent building, the appended thorough analysis of the different departments of construction will be of interest.

### MARBLES AND MOSAICS.

Special mention of the marble and mosaics in the Library building is merited because of their superb excellence. The staircase in the Washington street entrance is the *piece de resistance* that challenges universal attention. It is of Italian statuary marble—the famous marble of Carrara, and the exquisite mosaics are of royal green marble from Connemara, County Galway, Ireland. In the reading room we find the verd antique—that rare combination of white limestone, green talc and blackish green serpentine, the latter ingredient being so distributed as to impart to the rock a brecciated appearance. Verd antique was formerly found only in a few localities in Europe and in very small quantities. It is still a rare and costly stone, but a good quality is now found in the New England States. In the reference room is seen the beautiful siena, with its curious combination of yellow, purple, green and flesh-color tints. This marble takes its name from the town of Siena, Italy. A marble of like quality, though of quite different appearance, is the veined Italian, in the Randolph street entrance. Here also is the green-striped Vermont and the pink Knoxville and roseal marbles from the Tennessee district. In the G. A. R. rooms the verd antique and the pink Knoxville are again to be seen, and the minor rooms are adorned with pink Knoxville and C. F. Italian, the latter being a trade designation taken from the name of the importer of the highest grade of Italian marble. The mosaics inlaid in the marble and on the walls consist of tesserae of mother-of-pearl, geometrical bits of favrile glass and shells, set in endlessly varied linear patterns, sparkling in the daylight and flashing back like jewels the rays of the electric lights by night. The real richness of the interior treatment of the Library building is best appreciated after careful examination in detail of the beautiful marbles and mosaics above described. No building of recent construction affords a better illustration of the artistic and practical value of marble for interior construction.

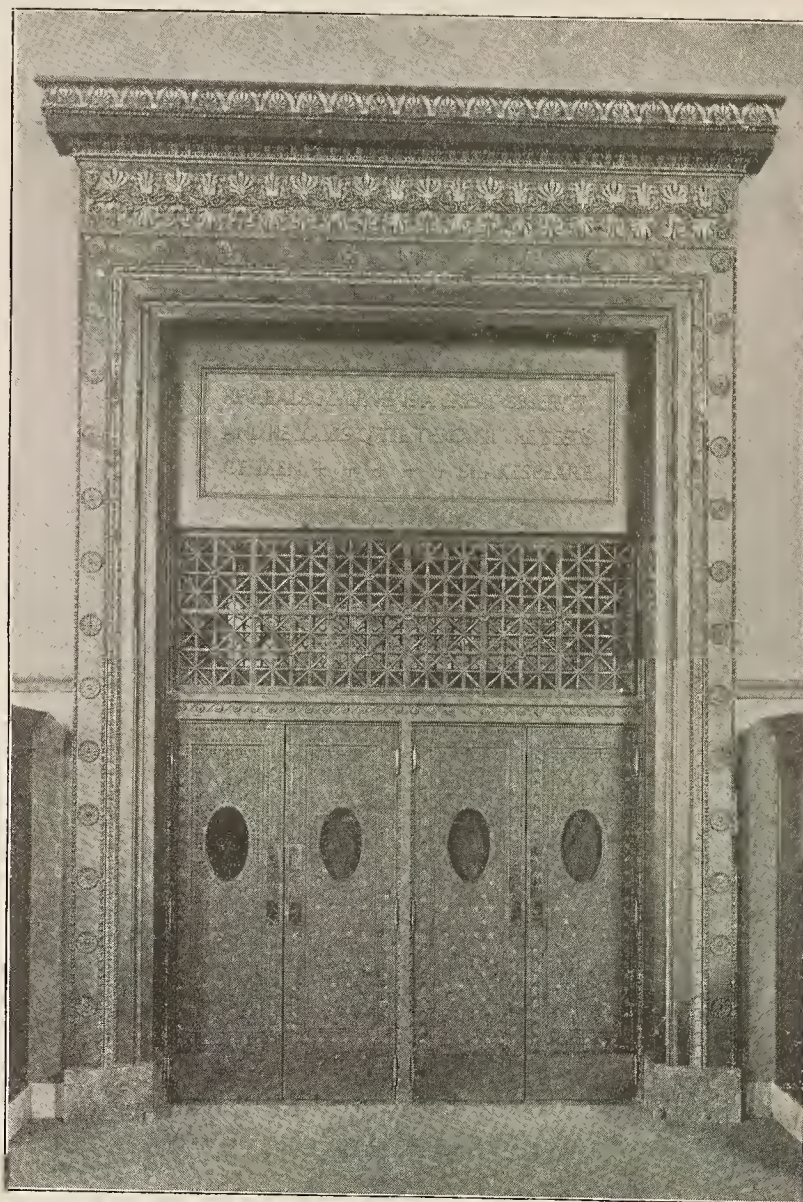
### EXTERIOR STONE.

The magnificent solid appearance of the exterior, its uniformity of color and texture is due in no small measure to the use of Bedford stone. The Bedford rock is an oolitic limestone of dense fiber which hardens on exposure to the air and retains its enduring qualities for centuries. The Bedford quarries are now world

famous as the result of the great reputation which this valuable building material has gained, and the use of their product in this great building is singularly appropriate.

### GRANITE.

Massive granite blocks challenge the attention of the observer at the entrance. In fact, the entire base course of the building



DOORS OF REFERENCE ROOM.



is of granite—Hallowell granite furnished by the company of that name, whose Chicago agent is George F. Bodwell, 1109 Rookery building. The steps at the entrances are excellent examples of this enduring stone. The feet of many thousands of book lovers will tread these blocks before they will show signs of wear. Outside the building also we note the large lamp bases of Hallowell granite, on which will be placed the solid bronze electric light standards, sixteen in number, around the building.

#### ORNAMENTAL IRON AND BRONZE.

On entering the building the first impression given to the visitor is that of the entire harmony and the remarkable beauty of

marble slabs which make up the heavier background. In the library building, genuine bronze and ornamental iron have been used lavishly. Wherever both practical and artistic considerations called for these metals they were specified, and the special designs and the workmanship are strictly in keeping with the general character of the building. No attempt was made, by the architects to intrude ornamentation of this kind where it was not appropriate, but, on the other hand, no expense was spared to make the metal work complete and perfect.

The extensive bronze front at the Washington street entrance, including the storm porch and the large semi-circular transom, is



DOMES OF ROTUNDA IN DELIVERY ROOM.

the interior finish. If the eye has been accustomed to artistic effects, there is not only no disappointment, but on the contrary, the keenest delight at viewing the superb building, as it were, of marble and bronze and iron work in the main corridor, the halls and great rooms of the building. Three striking objects at once meet the eye. They are the Great Seal of Chicago in the center and the two name tablets on either side of the doors. For a time the observer is halted before these bronzes of superb workmanship; then he passes on to view the grills, and gates, the balusters and numerous other bronze fixtures of the great interior.

Solid bronze is the appropriate metal to ornament the interior of a fireproof building of modern construction. Together with hand-wrought iron, it answers every desired purpose of the architect, and is an enduring accompaniment of the granite blocks and

designed in the Roman style to correspond with the general tone of the exterior of the building. This front gives an imposing effect to the entrance, and its value is best seen by comparison with the Randolph street front, where the bronzework is merely incidental. Both these fronts, as also the interior bronze and iron described in the following paragraphs, were made at the works of the Chicago Ornamental Iron Company, under the personal supervision of the president of that company, Mr. A. E. Coleman. It is needless to say that the gentleman named brought to his task all the enthusiasm which the importance of the work merited, with the result that the completed bronze and iron constitute one of the most valued features of the building.

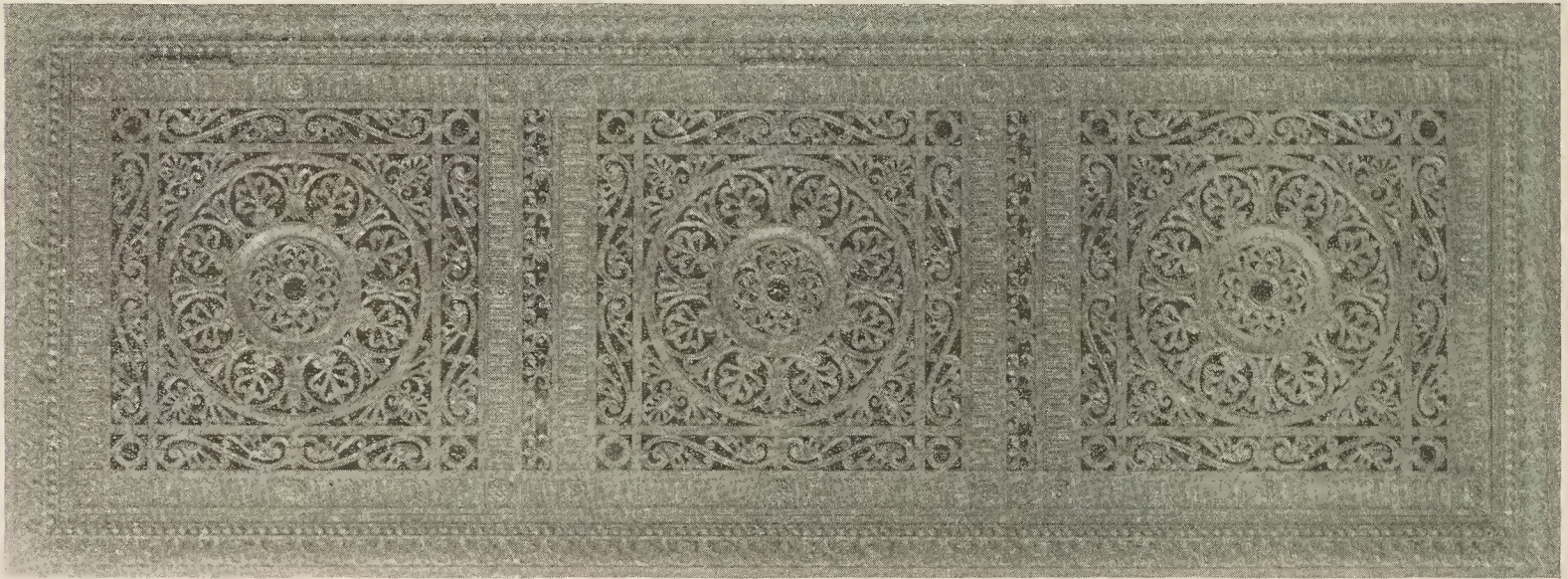
Just inside the Washington street entrance are the bronze name tablets, which attract the immediate attention of every visitor.



The illustration given herewith shows the detail of these tablets very faithfully. The seal also, at this entrance, is worthy of special notice. Both tablets and seal are of solid bronze. The execution of the designs and the finish of the bronze are points which should be observed. The too frequent dull and unattrac-

the whole forming one of the finest specimens of this class of work to be found in this country.

High above the delivery room desk is the iron dome and skylight. This iron construction also is the work of the Chicago Ornamental Iron Company, and is a good example of their



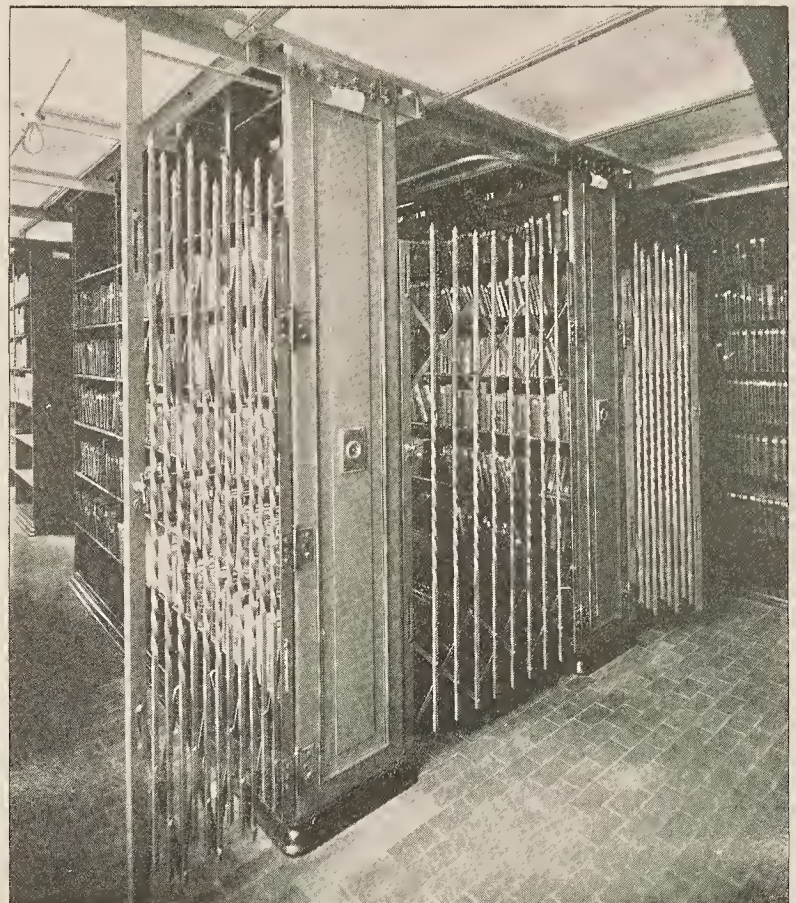
BRONZE GRILL.

ive appearance of bronze tablets has been avoided in this instance, as, in fact, in all the bronze in the building. It is a demonstration of the possibilities of beauty as well as utility in the use of this usually prosaic metal.

The elevator inclosures, both on the Washington street and Randolph street sides, and on all floors, are of solid bronze. The designs are on the Roman order, being patterned after ancient Italian gates. The elevator grills at the Washington street entrance are a reproduction of or adaptation from gates at St. Mark's, Venice. In fact, all the window and door grills throughout the building, except in the delivery room, are Italian in feeling or design. This treatment is not only harmonious but also unique in American architecture, and adds a new and interesting feature to this building.

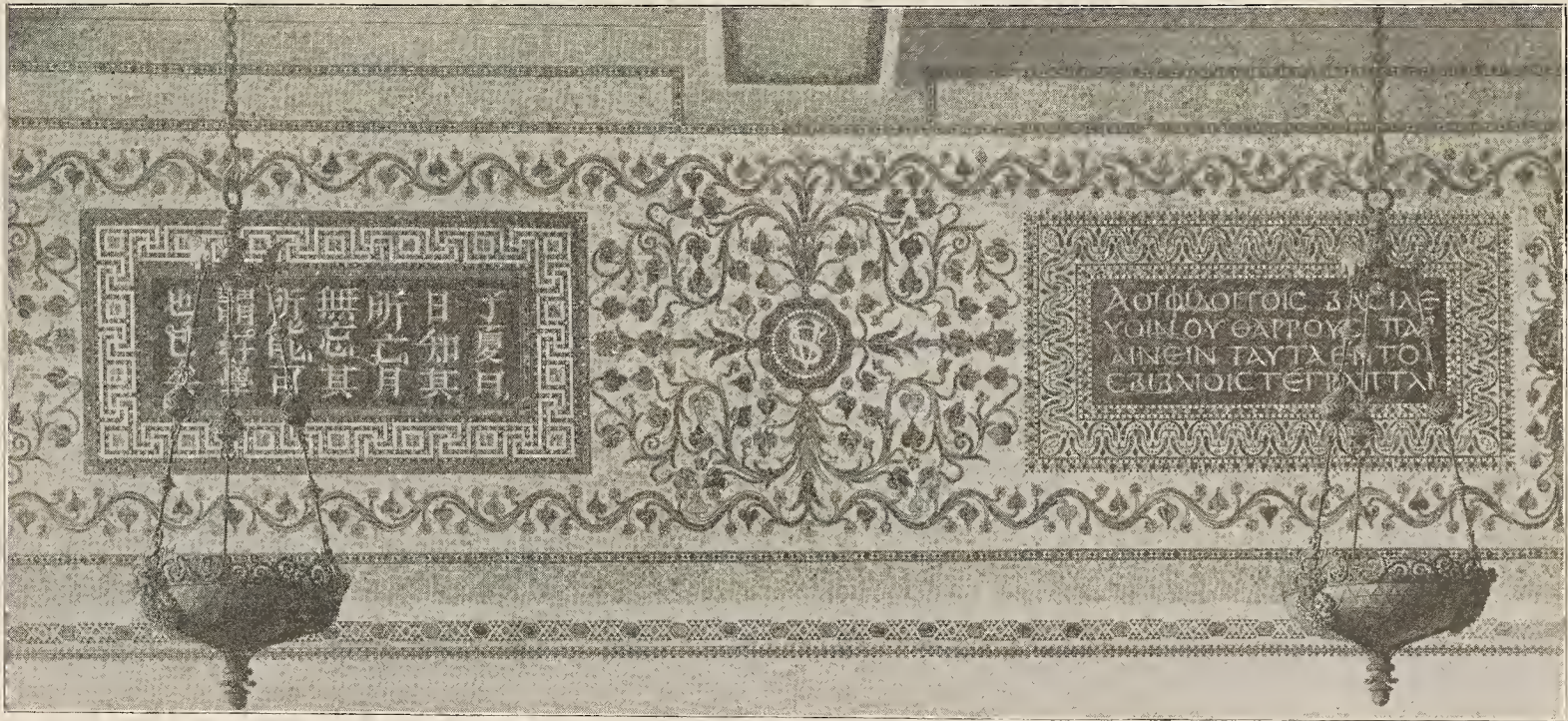
The grills covering the Moorish windows on the first landing of the main stairway (Washington street entrance) have attracted special attention. Even the bronze grills covering the openings of heating and ventilating shafts throughout the building have received careful treatment both in the matter of design and workmanship. At the entrance to the main corridor on the Randolph street side are heavy wrought-iron gates of imposing appearance. All the details of ornamentation on these gates are wrought by hand by individual workmen on the anvil. This art has been brought to a high degree of perfection of recent years. It is a sort of freehand sculpture in iron, and, while it aims to reproduce a definite design, it does so with all the variety and individuality of the artificer himself, with none of the slavish effects of machine work or mere copying. Before passing from the subject of grills, it should be said that the design of the elevator grill in the delivery room is taken from a Spanish Renaissance type as seen in their early seventeenth century cathedrals. The motif for the railing on the desk of the delivery room is from antique lamp standards, showing Greek influence. This part taken with the bronze lamp standards in the delivery, reading and reference rooms are all adapted from antique designs and form a good example of the possibilities of the artisan in bronze metal,

heavier architectural work. The same can be said of the large iron stairway leading from the reading-room floor to the mezzanine floor. This stairway is of bridge construction, prosaic enough in itself, but, as made with sharp straight lines and



ORNATE GATES IN STACK ROOM, FOR SPECIAL ALCOVE.





GLASS MOSAIC FRIEZE IN DELIVERY ROOM.



VIEW OF BOOK STACKS FROM DELIVERY ROOM.









PHOTOGRAPHURE.

ROTUNDA OF DELIVERY ROOM, LOOKING NORTH.



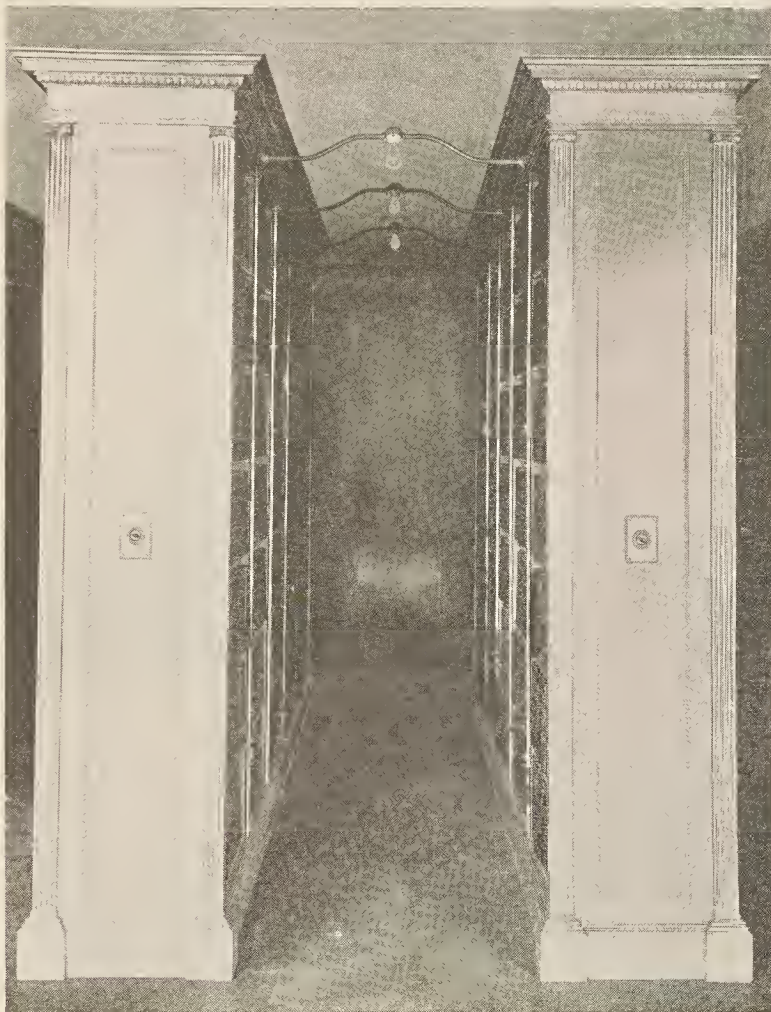
ornamentation and as completed with marble veneers, is a thing of beauty.

At the Randolph street end of the building there is some bronze work of remarkable beauty and value, but, unfortunately, not readily seen to the best advantage and therefore likely to be overlooked by the casual observer. It consists of the solid bronze balusters of the main stairway and the bronze soffit frames in the ceilings over the landings. The balusters, or spindles, which form a part of the stairway, are designed to endure as long as the building stands, and there is reason to believe that they will be in practically perfect condition long after the marble which surrounds them has crumbled into dust. Not only are the balusters of very substantial proportions, but the design also is pleasing, being of a pure, early Italian renaissance type. The bronze soffits, in the marble-paneled ceilings, relieve what would otherwise be a monotonous background. The richness of the bronze is in harmony with the beauty of the marble. It is a treatment well worthy of this magnificent building.

The foregoing necessarily brief description will suffice to give some idea of the extent and excellence of the iron and bronze work done by the Chicago Ornamental Iron Company. A close inspection of the library building by architects cannot fail to reveal other features of interest in this work, to which our space is inadequate.

#### BOOK STACKS.

The public library building of today, though built to cover a variety of wants, must above all be considered as a repository for books. This is the first truth impressed upon the visitor on his



METALLIC BOOK CASES IN ENGLISH PATENT ROOM.



SIDE AISLE IN MAIN STACK ROOM.

entrance to the main delivery room. Architecturally, the book rooms have been treated as the central feature in the building around which all other departments are grouped. It is natural, therefore, that a keen interest should be displayed in these store-houses of learning with their "miles of knowledge." In no one feature has there been greater advance in library construction than in the equipment of storage or stack room for books. Much less care was formerly given to this feature, books being more often stored with a view to architectural effect than to their own good. Today, however, they are almost invariably grouped together in compact form arranged for convenient handling in rooms especially adapted to their wants.

Five stack rooms have been provided in the Chicago Public Library, each three stories high; three only, however, of the above being at present furnished. The leading features in their equipment are as follows:

*All* interior fixtures are incombustible, the shelves, uprights and framework being of steel, the floors of glass and tile. Electric lighting only is employed. Rolling steel curtains are arranged between the delivery and stack rooms to completely separate this part of the building from the remainder, when desired.

Special attention has been paid to ventilation, the books on all sides being open to the air. An even temperature throughout is secured, slots or openings being provided in the floors around all cases and around the walls.

Natural light is introduced into the cross aisles of all stacks, its distribution being aided by the glass floors. A novel and



effective treatment has been adopted in the introduction of the artificial or electric light work. The wires are run throughout in protected conduits, these being carried concealed in the ends of the cases. Where brought out into the aisles the conduits are treated as fixtures in themselves, neat and substantial armored receptacles being provided for the lamps.

The distribution of the books has received careful attention, the stack rooms being adjacent to the main delivery room, and the transfer of books from floor to floor being facilitated by ingenious electric book lifts.

The work is finished throughout in baked enamel of a cool and pleasing tint of pale blue. The cases so finished, brightened

It is claimed for the system of shelving adopted, first, that a positive and easy method of adjustment is secured, any shelf being readily removed without the use of tools or appliances, the shelf and upright being each formed from one sheet of metal without any third or intermediate part between them.

Second, the absence of all necessity of future repairs, there being no small parts to get out of order, no shrinkage possible of the shelves and no cast iron to break.

Third, the least possible wear upon the books is obtained, all the surfaces with which the book comes in contact being absolutely smooth and free from projecting lugs or other features, and all the surfaces with which the book might engage when being placed



MAIN AISLE IN PERIODICAL STACK ROOM.

and enriched by the warm and varied tints of the books themselves, form an attractive and appropriate background for the ornate and stately rooms surrounding them.

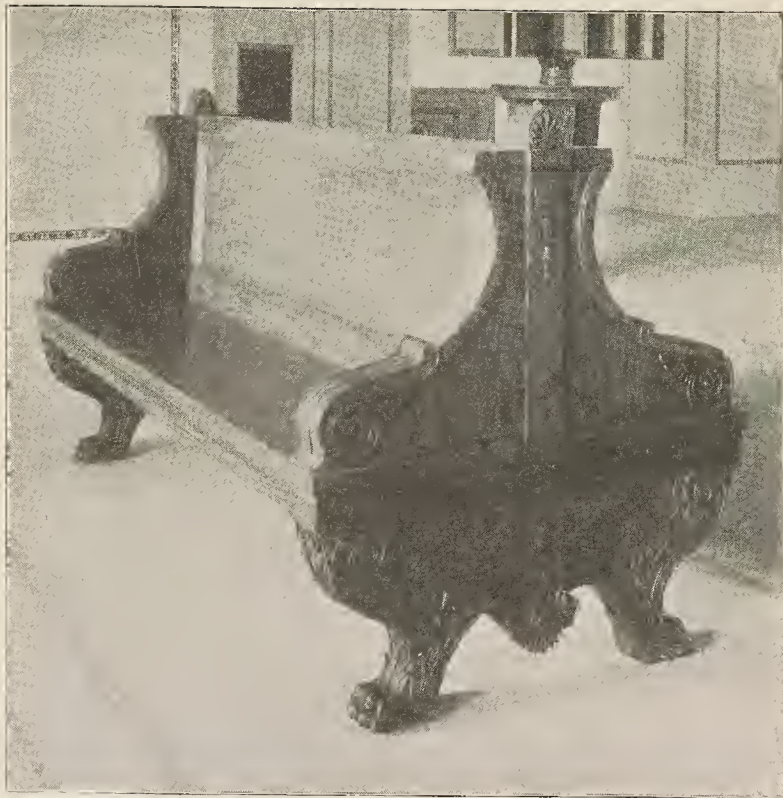
The construction of the interior framework and cases is entirely of wrought metal, being built by specialists in that line, the Fenton Metallic Manufacturing Company, of Jamestown, New York, with branch offices in this city and New York. The uprights themselves are formed of single sheets of slotted metal bent into a rigid U shape; the shelves are made of sheet steel stiffened at the front and back by a strong  $\frac{3}{8}$ -inch roll.

in the case being rounded. Solid and continuous uprights are furnished at all points for a bearing for the books.

Other rooms throughout the building are fitted in a similar manner, though in a more ornamental fashion. The storage room for bound newspapers is equipped with massive cases of steel fitted with adjustable roller shelves. Other rooms are furnished with case work on the order shown in our illustration of work in the English patent room.

It may be of interest to know that the system of stack work above described has also been adopted for the public libraries at





WHITE MAHOGANY SETTEE.

Kansas City, Missouri; Burlington, Iowa; the New Columbia University building in New York, and public libraries at Providence, Rhode Island, and elsewhere.

## ELECTRIC LIGHT FIXTURES.

The general plan of special designs in harmony with one another was applied to every detail of the building. We find it in the electric light fixtures, which are modeled after patterns strictly in keeping with the entire art scheme of the library. The first striking illustration of this treatment is seen at the main entrance, in the large brackets of solid bronze which are so appropriate when put in juxtaposition with the other bronze of this magnificent vestibule. It is further seen in the solid bronze chandeliers, table lamps and ceiling lamps which stud the interior. The effect throughout is harmonious, and wherever, in some few instances, bronze would be inappropriate owing to the character of the surrounding work, brass has been substituted. This plan has been followed out with most rigid regard for artistic effect by the Oxley & Enos Manufacturing Company, of New York, by whom all the electric fixtures were manufactured. Though the general effect when seen by day is pleasing to the eye, it is best appreciated at night when the thousand and one lights of the building are streaming forth their radiance on the surrounding readers and the soft contrast of table and ceiling and bronze mingles in a pleasing symphony of color so restful to the eye.

## INTERIOR WOODWORK.

Fine interior cabinet finish, in keeping with the general character of the library, is a feature which at once challenges the attention of the visitor. The first view of this work is usually obtained in the delivery room, where desks and counter of surpassing beauty are the most striking objects to be seen. The illustrations of the delivery room shown in this connection give a fair idea of the elegance of this work, which, throughout the building, is the product of the Edmunds Manufacturing Company's factory, Chicago.

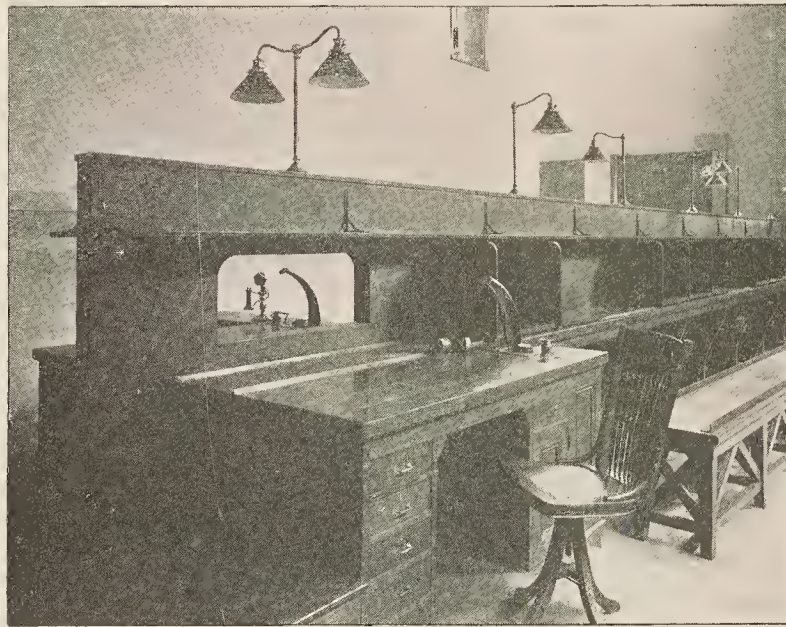
The delivery room desk and counter is built up five-ply, with veneer of white mahogany in front and back. The front is of

crotch veneer, sawed from the logs at the point of bifurcation, and the grain is so closely matched as to present a uniform appearance along the entire length of the counter of one hundred feet. The richness of the general effect of this treatment can be appreciated only by a close examination of the work itself. At each end of the counter is a return to walls, consisting of a white mahogany railing with heavy balusters artistically carved. A similar counter adorns the register room.

In the reading and reference rooms the cabinet work consists of counters and book cases. In the reading room quarter-sawn white oak presenting large flakes is used, the finish being a dark green, to correspond with the decorations. In the reference room the same wood is used, but the finish of both desks, counters and book cases is a light gold bronze, of exquisite appearance. The cabinet work throughout is in the very highest style of the art, and is most creditable to the contractors.

## FURNITURE OF SPECIAL DESIGN.

To design and build furniture that should be on a scale of magnificence in keeping with the building itself was no easy task. For the reading room there were required twenty-two oak tables, eight newspaper stands and one rack (Pollard finish); for the reference room, twenty tables and one atlas case (green antique oak); delivery room, six white mahogany tables, sixty stools with bronze bases, and two double settees. The designs for this furniture, as prepared by the architects, were monumental in character. They called for construction which for the ordinary furniture builder would have been impossible. The hand carving alone was so extensive that it figures in at least one-third the cost of the completed work. The best carvers in the West, both of the German and Italian schools, were put on this work by the manufacturers, The A. H. Andrews Company, and their exquisite mod-



PNEUMATIC DISPATCH TUBES.

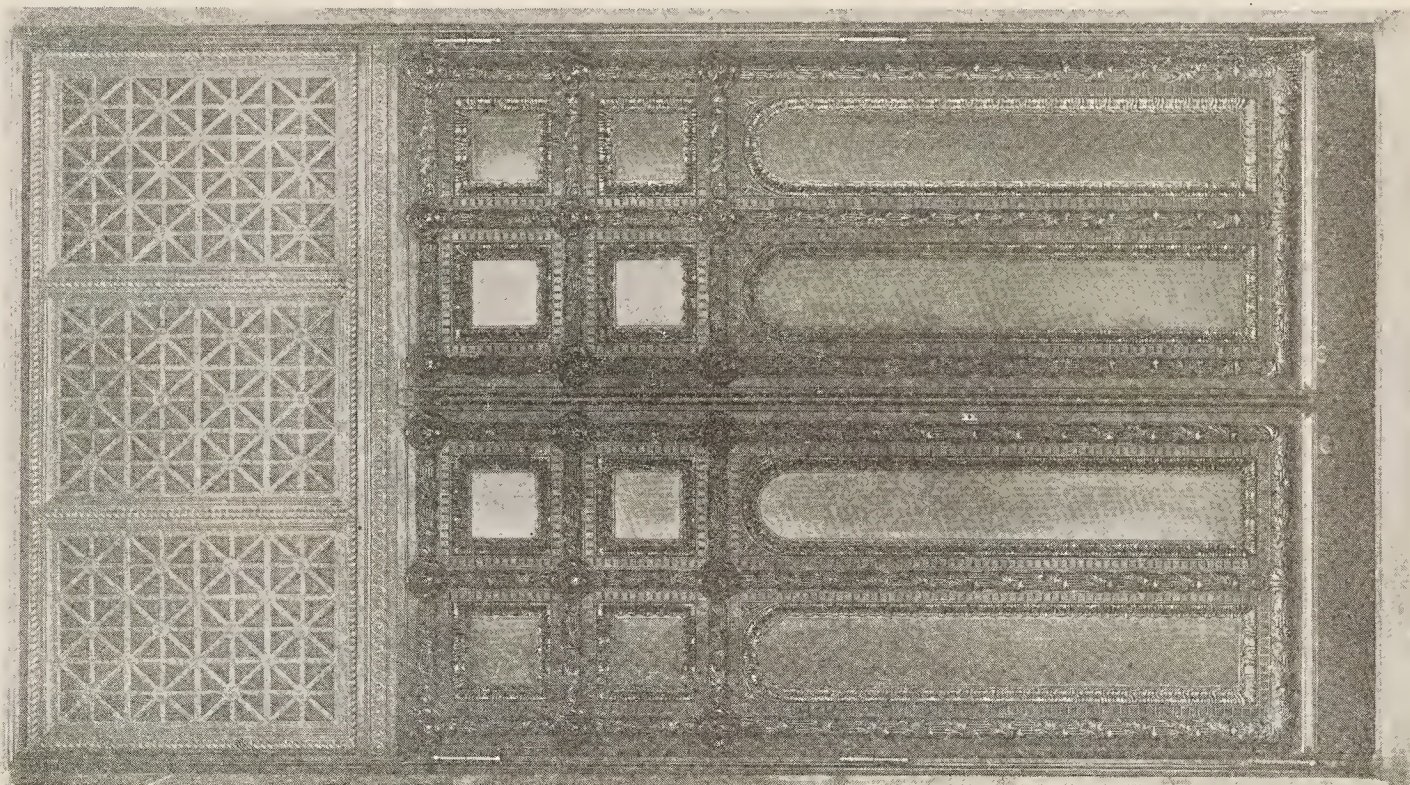
eling of the designs and delicate manipulation of the chisels have resulted in fine expression without resorting to polishing.

In selecting the oak for the tables the manufacturers took lumber from three to ten years old and divided all their first quality of clear quarter white oak into three grades, with reference to the figure, namely, ordinary, selected, and finely selected, the latter grade being that figure which shows the radial medullary septa very nearly parallel with the exposed surface of the board,





DOORS OF READING ROOM.



CARVED MAHOGANY DOORS AND GRILL, NORTH ENTRANCE.





TELEPHONE OPERATING CABINET.

presenting to view the broad white flakes. Of this grade only one-tenth was considered good enough for the work. Special mechanical devices were used to allow the 2-inch table tops to expand across the grain without in any way interfering with the design or stability. By this arrangement the tops are practically insured against the effects of a changeful atmosphere. The table legs, apparently solid, are from four to six inches thick. A moment's thought will bring to mind the unusual mechanical difficulties presented to The A. H. Andrews Company in their successful execution of this work. The finish is a wonderful tribute to the skill of the artisan. It was designed not with a view of making an imitation of plate glass, but to show the natural beauty of the figured wood, and, incidentally, to be a preservative against moisture and dirt.

## ELECTRIC CLOCKS.

"Nor fits it to prolong the heavenly feast  
Timeless."

So says the poet; and lest in the intellectual feast of good things in which the library abounds the entranced reader should become unconscious of the lapse of time, there has been provided a synchronous system of clocks extending to every part of the building.

All the clocks in the library building are regulated by electricity from a "master" clock located in the basement. The

electrical secondary clocks are twenty-eight in number, of which twenty-two have dials sixteen inches in diameter, two have dials thirty inches in diameter, two thirty-six inches, and two forty-four inches. The system is known as the E. Howard Watch & Clock Company's Electric Clock System. The secondary clocks are divided into three nearly equal sets, which are actuated by the master clock alternately on the 55th, 60th and 5th second of each minute. The electricity for operating the system is generated by a battery specially adapted for this purpose and applied only to these clocks. The wires used in transmitting the electric current are of the best quality for this service and are inclosed in special conduits. The illustration shows one of the clocks with special decorative designs.

The master clock has a high-grade regular movement, with Graham dead beat escapement, maintaining power, pendulum beating seconds, and is capable of keeping time within a variation of fifteen seconds per month. The movements of the electrical secondary clocks are the same, in sizes adapted to the dials. Some of the cases are made of quarter-sawed white oak, and some of bronze. The clocks in the delivery rooms, Nos. 9 and 11, in reading and reference rooms, in rooms Nos. 1, 2, 7 and 8 on the delivery floor, and room No. 1 on mezzanine floor, do not have cases exterior to the wall, but the works are inclosed in dust-proof boxes.

## TELEPHONE SYSTEM.

In a building as large as the Public Library, and where many departments are in operation, it is essential that there must be quick and certain communication from one to another. It is



CAST-IRON STAIRS AND RAILINGS—MEZZANINE FLOOR.





BRONZE ELECTRIC LIGHT FIXTURE.

found that nothing will accomplish this as readily as the telephone, and after investigation of a number of appliances, a private branch and private telephone exchange as operated by the Chicago Telephone Company was installed. Telephones are placed in twenty-four rooms and the lines concentrated at a switchboard of the "Express" pattern, which is in charge of the operator employed by the Library for that purpose. Trunk lines lead to the general telephone exchange, and not only may the employes of one department talk with another within the building, but those who have outside business may call or be called up by any of the subscribers within the Chicago Telephone Exchange. The business of the Library is greatly expedited by this installation, which is, in general design, what is now furnished by the Chicago Telephone Company to railways, large offices, banks and other corporations in which the telephone is one of the greatest economizers of time.

## PNEUMATIC DISPATCH TUBES.

To insure the utmost speed, certainty and quietness, in transmitting the membership cards between the sub-station department on the first floor and the general delivery or circulating department on the

second floor, where they are stamped and checked and then returned to the sub-station department, the Bostedo pneumatic tube system is used. The system is known as the Independent Double Line Vacuum System, and consists of two "stations" in each department on four lines of seamless brass tubes; each station having a sending and a receiving tube. Through these tubes, which are three inches in diameter, there is constantly being exhausted a strong current of air, suction being produced by a compact blower, of the positive type, which is operated by a small electric motor. The tubes are connected with this blower by a galvanized iron suction pipe six inches in diameter. The air exhausted through the tubes by the blower is conveyed through another galvanized iron pipe, known as the discharge pipe, and discharged into a smoke flue.

The tubes are concealed from view by being laid between the floors, and there is no part of the system visible except the receiving terminal at each station. These terminals are of special design, and are handsomely plated. The sending and receiving devices with which the tubes are fitted, are automatic in their action, and the carriers are discharged automatically and noiselessly from each terminal. The carriers, or cartridges, into which the membership cards are put to be transmitted through the tubes, are made of leather and are four inches long and two and three-quarter inches in diameter. Four carriers are furnished with each station.

The direct operation of sending a carrier is as follows: The light leather lid upon the sending tube is opened and the current of in-going air seizes the carrier and conveys it at a speed of about thirty-five feet per second to the terminal at the other end of the line, where it is automatically discharged and falls directly in front of the attendant, who stamps and checks the cards, puts them again into the carrier which is then inserted in the return tube, where the current of out-going air takes it back and discharges it at its proper station. The entire operation consumes much less time than it takes to tell it. The capacity of the system will allow of carriers being sent in rapid succession if desired.

The motor and blower, required to operate this system, occupy



INTERIOR VIEW OF VAULT, SHOWING METAL FURNITURE.



a small space of 4 by 8 feet in the basement, and are set upon a support projecting from the side wall. Both of these machines are noiseless in operation and require very little — if any — attention.

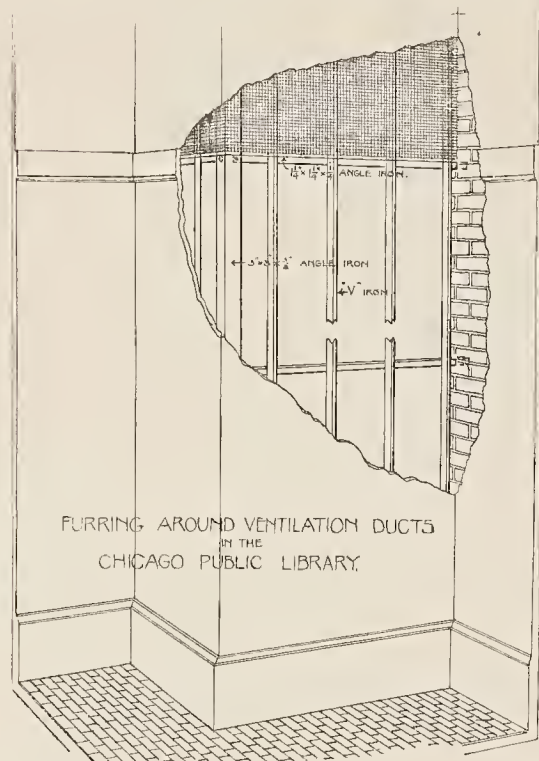
The system is in almost constant use and is regarded as a great economizer of time and labor. The system was installed by the Bostedo Package and Cash Carrier Company, of Chicago, New York and London.

#### THE IRON FURRING AND WIRE LATHING.

"In the elder days of art,  
Builders wrought with greatest care  
Each minute and unseen part,  
For the Gods see everywhere."

—Longfellow.

Those portions of the building which are unseen are of quite as great interest to the architect as those that are seen. In fact, a description of them should be of even more interest, because their construction is not readily perceived by the eye. Iron furring and wire lathing form grounds for all the ornamental and plain plaster, and, in many instances, for marble, throughout the entire building. The Voss system is used exclusively and the entire



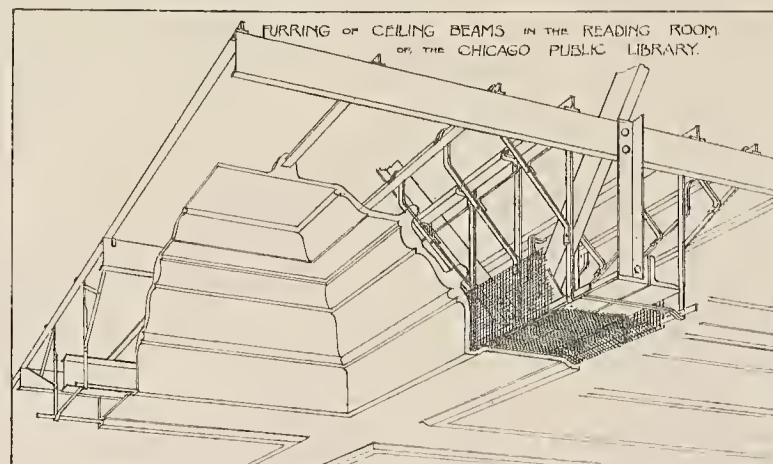
work was done by the inventor himself. All beams, girders and cornices are furred out with iron brackets which are made of the required shape to conform to the ceiling or wall molds, and when covered with wire lath are ready for the plaster. All brackets for cornices and beams are set eighteen inches between centers and are cross-furred with Voss' patent stiffened V-shaped iron, which is bolted to the

brackets. The result is an open iron framework of the required shape, to which the wire lathing is secured by means of a steel wire tie placed at intervals of about four inches. All the air shafts and partitions are furred in the same manner with Voss' patent V-iron uprights, set about twelve inches between centers and cross-furred with similar V-shaped irons, set about nine inches between centers. To this the wire lathing is fastened by means of the wire ties. The illustrations given herewith show the peculiar methods of the Voss system in detail, as applied to the most difficult situations likely to arise in practical construction.

The patented V iron bars referred to are made from 2-inch No. 18 Bessemer steel, rolled into the required shape by special machinery. This construction has been found to combine great strength with lightness. The V shape enables the inventor to use a much lighter iron for the purpose required than is commonly specified for iron furrings, as the irons when bent into this shape are found

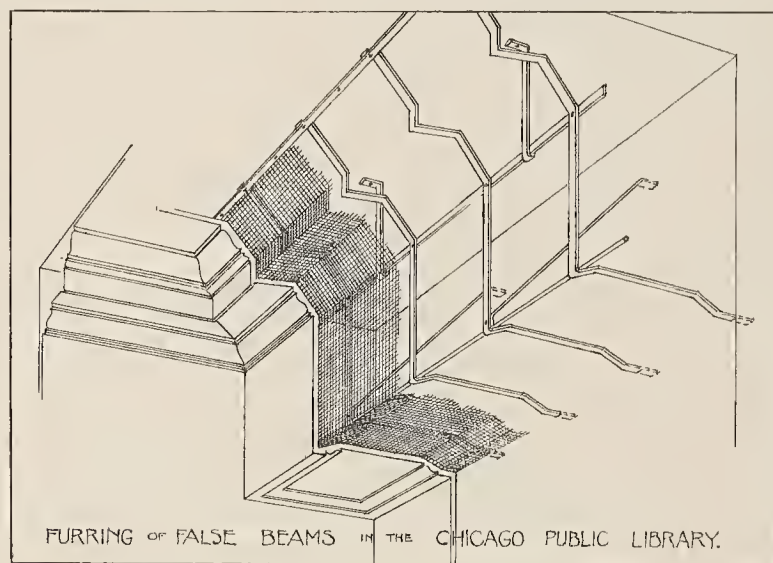
to have a greatly increased carrying capacity. The advantage of this arrangement becomes evident when it is considered that the ordinary iron furring imposes an enormously heavy burden on the under side of floors, on coves and walls. A considerable saving in weight is, therefore, very desirable.

The ceilings in all minor rooms are suspended from I-beams. The carrying bars are 2 by  $\frac{3}{16}$  inches and are hung to the I-beams



by wrought-iron hangers, which are clamped to the beams with wrought-iron clamps. The carrying bars are placed about four feet between centers and are punched every twelve inches to receive V-iron cross-furrings. Under the furrings is the stiff wire lath to which the plaster is applied.

The ceilings in the reading and reference rooms and also all the paneled ceilings in the Grand Army rooms are suspended from iron trusswork. Wrought-iron brackets, fashioned to the required shape, and set about eighteen inches between centers, are fastened to the trusses in much the same manner as to I-beams. They are also similarly cross-furred, and are then ready to be covered with the wire lath. This construction combines the minimum of lightness with the maximum of strength and rigidity required for this work. When all the parts are properly riveted and fastened

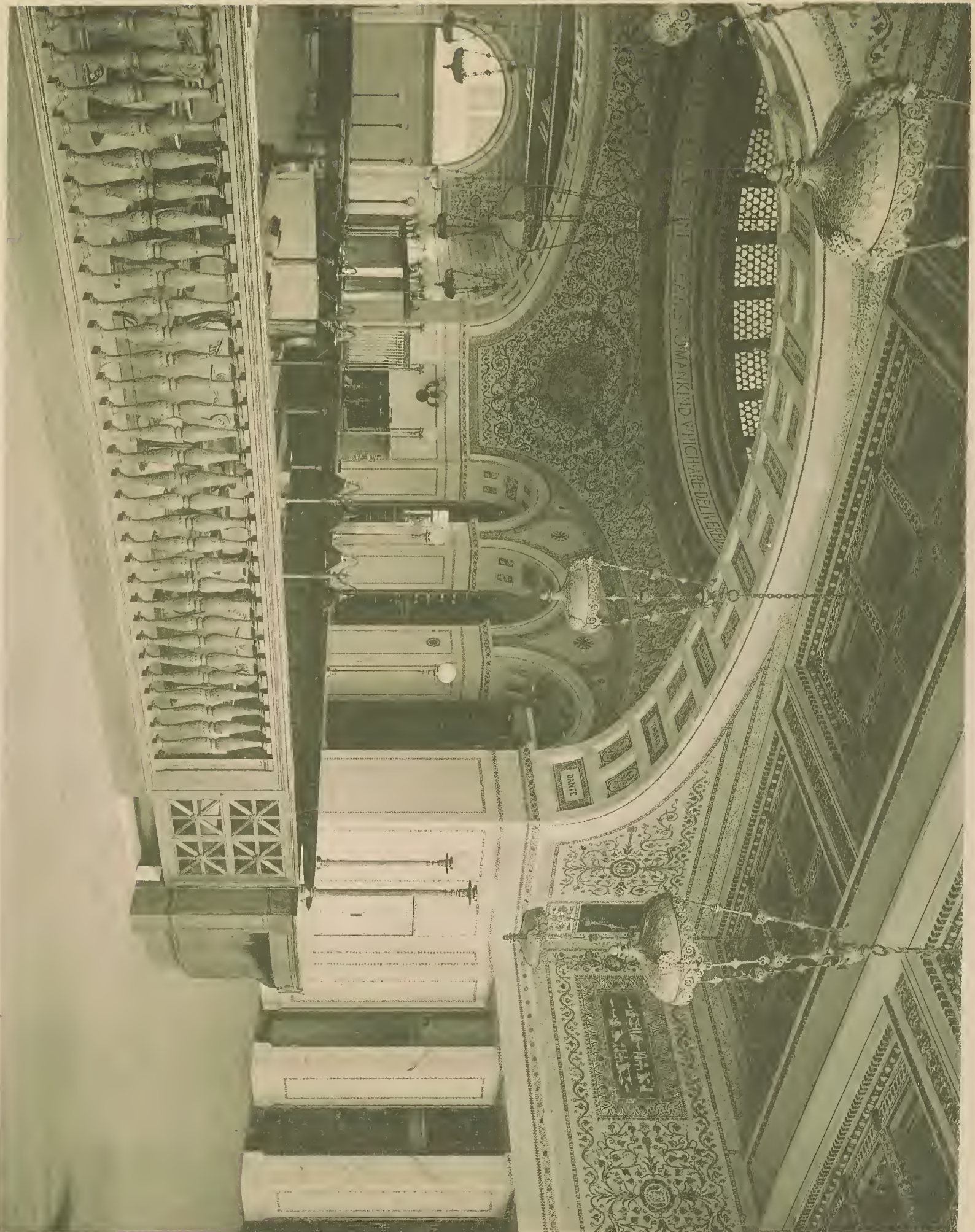


together they form one solid ground, against which plaster can be applied with the certainty that it will not be disturbed from within. The work in this building was done, fortunately, under the personal supervision of the inventor and manufacturer of the Voss system of iron furring and wire lathing, Mr. Frederick Voss,









PHOTOGRAPHY.

GENERAL VIEW OF DELIVERY ROOM, LOOKING WEST.







or sliding shelves on which books or papers can be examined without removal from the vaults.

#### POETRY IN STONE.

If there be any quality of the abstract in the concrete, it should certainly be discovered in a library building. If there be poetry in stone walls, why not in a concrete sidewalk? Engineers who have examined the concrete work at the public library building, say that it comes as near being a poem in stone as anything of the kind they have ever seen. Engine foundations and basement walls would seem to be hard, cold facts in architecture, but when they represent the highest type of their class, they are more than facts, they are the expression of ideals. The contract of Stamsen & Blome, of the Unity Building, Chicago, included the sidewalk around the library building, the concrete arched boiler-house roof, the large engine foundations, the pipe trenches, the blower pits, and the floors, steps and concrete retaining walls throughout the basement. The sidewalk is said to be the largest of its kind around any single building in the world. The engine foundations have been especially commended. The work is all of granite concrete, and evinces the competence of the contractors, Messrs. Stamsen & Blome, whose previous experience had extended to the laying of millions of feet of sidewalks and floors, in addition to a corresponding amount of other concrete work.

#### IRON AND STEEL CONSTRUCTION.

The construction of the Chicago Public Library is not made on the style of the usual Chicago skeleton-steel construction, but the whole iron construction rests on the walls of the building, there being practically no iron or steel columns; the long spans between walls are bridged over mostly with box girders, also plate girders and lattice girders with beams between same; the spans of box girders are sixty feet and the weight of same ranges from twelve to eighteen tons per piece.

The weight of box girders, plate girders and lattice girders approximates one thousand three hundred tons; the weight of beams, tees, anchors and other structural material about one thousand tons, or total about two thousand three hundred tons structural iron and steel work.

The main contract for furnishing and erecting the structural iron and steel work, comprising also the greater part of the stair-work, was awarded and carried out by the firm of Binder & Seifert, civil engineers and contractors, and after this firm went out of existence, some supplemental contracts by Carl Binder, civil engineer and contractor (formerly partner of the firm of Binder & Seifert), 903 Schiller building.

#### PLUMBING.

Plumbing, inclosed in a wall, is neither showy nor ornamental, but its importance is second to no other feature in a building. In the Library the utmost consideration was given to this work; it must be the best that the art of the plumber could devise and execute; and this idea has been strictly realized in the work as completed. The plumbing contract proper included the suspended sewerage, but not the ground sewerage nor the fixtures, and was executed by E. Baggot. The Durham system of drainage was used throughout. This system, which is familiar to architects, makes use of wrought-iron pipes with shoulder fittings. These fittings are manufactured by E. Baggot after the most approved patterns. The Durham system has been thoroughly tested and has given excellent satisfaction. It was chosen for the Library building as representing the best system for the purpose now in existence.

At the north end of the building at the entrance to the reading and reference rooms are two drinking fountains of solid bronze, which are worthy of special mention. The ornamentation con-

sists of dolphins. Connected with the fountains are two filters, ice coils, etc., all strictly in keeping with the modern plan of the building.

#### FIREPROOFING A GREAT BUILDING.

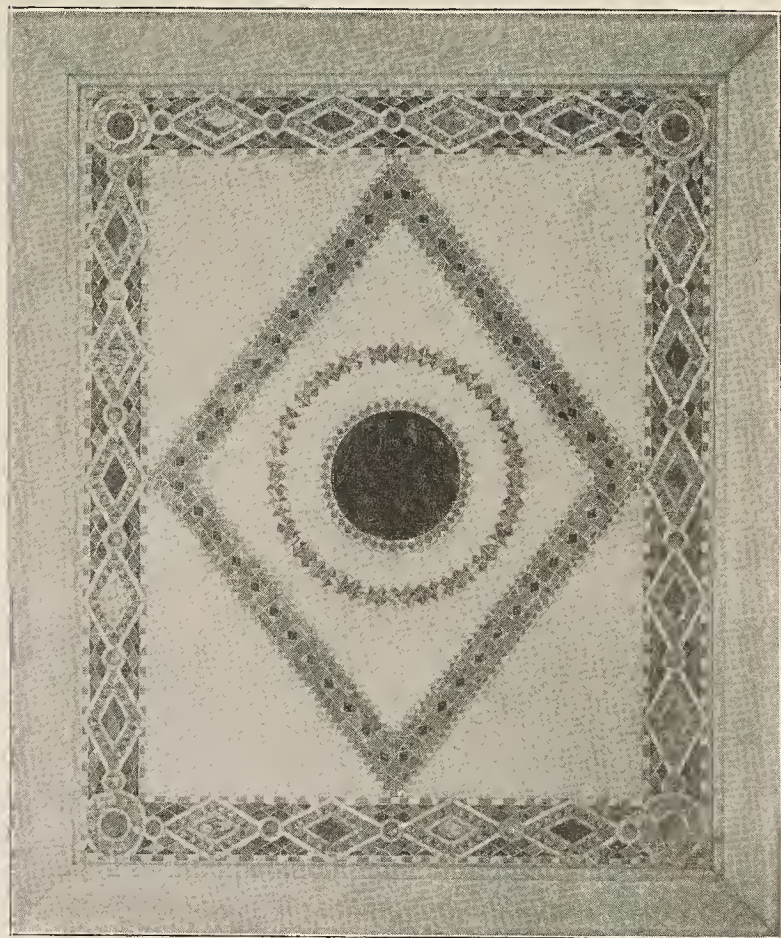
How shall a library building be made fireproof? This is a momentous question, for on its proper decision depends the security of all the treasures which such a structure contains. It is a question which demanded the best thought and most earnest consideration of the board of directors. After no little discussion they selected terra-cotta lumber as the proper fireproofing material.

Porous terra cotta is made from blue clay, by a peculiar process of mixing and burning, whereby the completed product is made porous. When made into certain convenient forms for architectural purposes, this product is called "Porous Terra-Cotta Lumber," and it was this material that was relied on to protect all parts of the library from possible attacks by fire. The process referred to is the mixing of sawdust with the clay, while the latter is in a plastic state, the sawdust being destroyed during the process



DRINKING FOUNTAIN — BRONZE DOLPHIN SPOUT.





DETAIL, PANELS OF CARRARA MARBLE AND GLASS MOSAICS,  
BALUSTRADE.

of burning, thus leaving the finished product porous or cellular. In the actual work of fireproofing the usual methods were followed; the floor arches and partitions were constructed of the porous terra-cotta lumber, and the girders and columns were incased with it to such a thickness as to thoroughly protect them from fire. Experience has proven that an interior room or a shaft in such a building may take fire and burn fiercely for hours without endangering the rest of the structure. The terra-cotta linings give much the same protection as the flue lining of a chimney, and are quite as safe. All this material was supplied and put in place by the Illinois Terra-Cotta Lumber Company, of Chicago.

#### PLASTERING.

Intimately associated with the decorations of any building is the heavier work of plastering. It is the foundation on which much of the ornamental work rests. The story goes that a wealthy gentleman once made the mistake of putting expensive decorations on cheap and faulty plastering in his residence, with the result that in a short time the entire interior was a ruin and had to be torn out and replastered. It was a costly lesson, but one, unfortunately, which many builders learn. Not so with the library building. The first care of the architects in providing for the interior finish was to select a first-class plasterer. The work was intrusted to Mr. J. A. Boland, of 822 Chamber of Commerce building, Chicago, on whose skill and fidelity was staked the soundness of every square yard of plastering in the building. It is a fact against which even the most experienced builders have to contend, that plastering is good or bad according as the plasterer is reliable or otherwise. It is a work of confidence — too often of misplaced confidence. A fair exterior may cover a thoroughly bad job. And not infrequently, in an attempt to economize,

thousands of dollars are thrown away on plastering which proves to be worse than worthless.

#### CABINET WOODWORK — G. A. R. ROOM.

The woodwork in the Grand Army room is of the best grade of East India mahogany and quartered oak, the screen around the committee room being quite ornamental in design, with pilasters, molded bases and ornamental caps, molded and carved cornice and acroteria. The doors of the various rooms, being exceptionally large in size, are veneered on a 5-ply pine core. The wood in all cases is selected for its fine grain and flashings, and all panels and other portions are so arranged as to give the best results as to the color and matching of the grain and flashings of the wood. This work throughout is by the Matthews Brothers Manufacturing Company, of Milwaukee. The quartered oak finish in the assembly room is exceptionally interesting, as with its dark color and great amount of flashing, it greatly resembles English oak.

#### ORNAMENTAL IRON.

One of the impressive features in the interior of the Chicago Public Library is the magnificent dome of the Assembly Room of the G. A. R. section. This massive ornamental dome is constructed entirely of cast iron, which, in addition to its structural strength, lends itself readily to the most intricate and delicate designs. The



BRONZE ELEVATOR INCLOSURES, NORTH ENTRANCE.  
(See page 22.)



modeling is brought out in strong relief by the artistic color treatment of the iron, and the dome is made complete by the use of colored art glass wrought into elaborate designs, the whole being one of the most beautiful of its kind in existence. The entrance to the G. A. R. rooms and the window frames and grills on each side are of genuine bronze metal.

Especial care was taken in modeling the patterns for this work, as the object desired in the foliated border was a small, delicate figure, brought out in high relief and vigorous lines.

In the large Memorial Hall, the walls up to the spring of the door arches are of green marble, arranged into panels by the use

bronze. The four large doorways of the reading and reference rooms are of cast iron. These are designed in strictly classical style and executed with the utmost care. The detail is clean-cut and distinct, accentuated by the masterly color treatment which characterized the whole interior.

The large pilasters in the reading room and the bases to the pilasters in the reference room are also of iron. These are in the same style as the doorways. To those who can appreciate the beauty which art and skill, a simple hammer and an anvil can create from that sturdiest of all metals, wrought iron, attention is called to the radiator grills which extend around three sides of



DOMES OF ROTUNDA IN G. A. R. ROOMS.

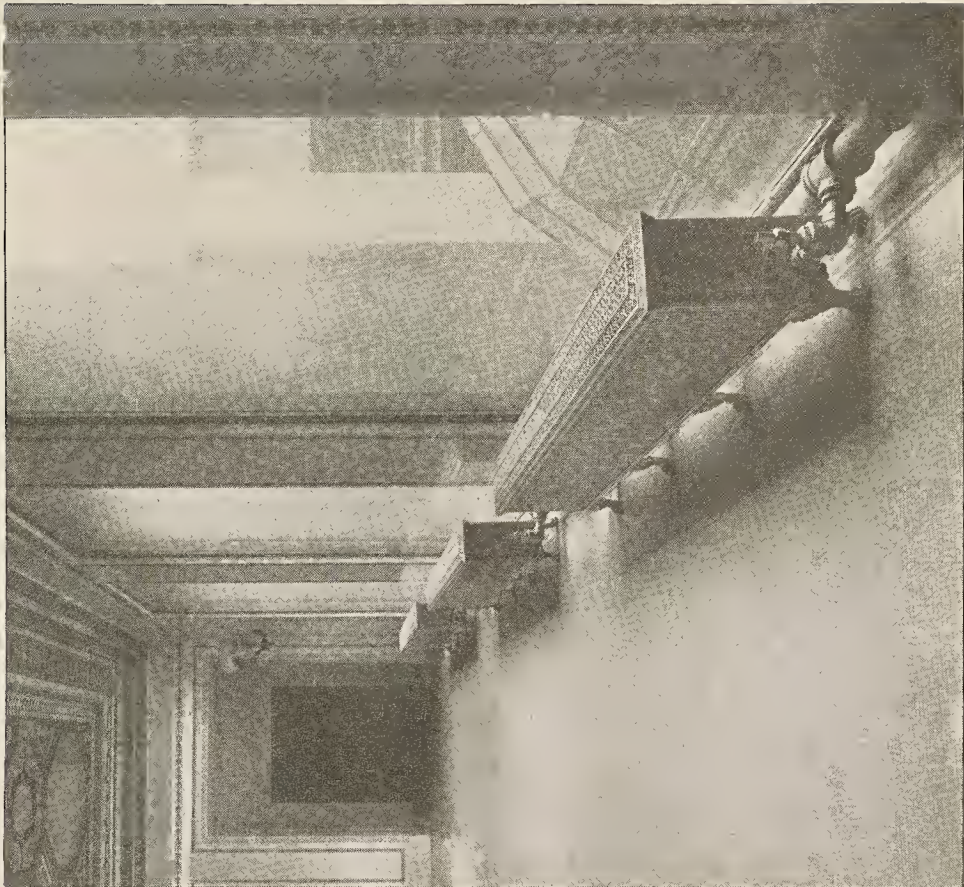
of bronze molding, the whole being surmounted by a bronze cornice running around the entire room. In this room are also four large flag cases, made of bronze metal and plate glass. What was said of the entrance applies to all of the bronzework in this room also; delicate foliated designs in high relief and strong, clean-cut lines. All of this bronze has been left in the sand finish and has been oxidized to an antique green color in the low surfaces; the high lines being comparatively bright. One thing which perhaps everyone will notice at a glance, is the exceptionally beautiful effects of using bronze and green marble together. A better combination of bronze and marble would be difficult, probably impossible to design. All of the register faces in these rooms are also of

the reading room. This intricate design is put together without screws or rivets, being held together entirely with small bands. All the iron from which the scrolls are bent was first hammered so as to taper off wider and thinner, and the band connections are made so that the tapers run in opposite directions, preventing any possibility of slipping. These grills are masterpieces of hammered wrought ironwork.

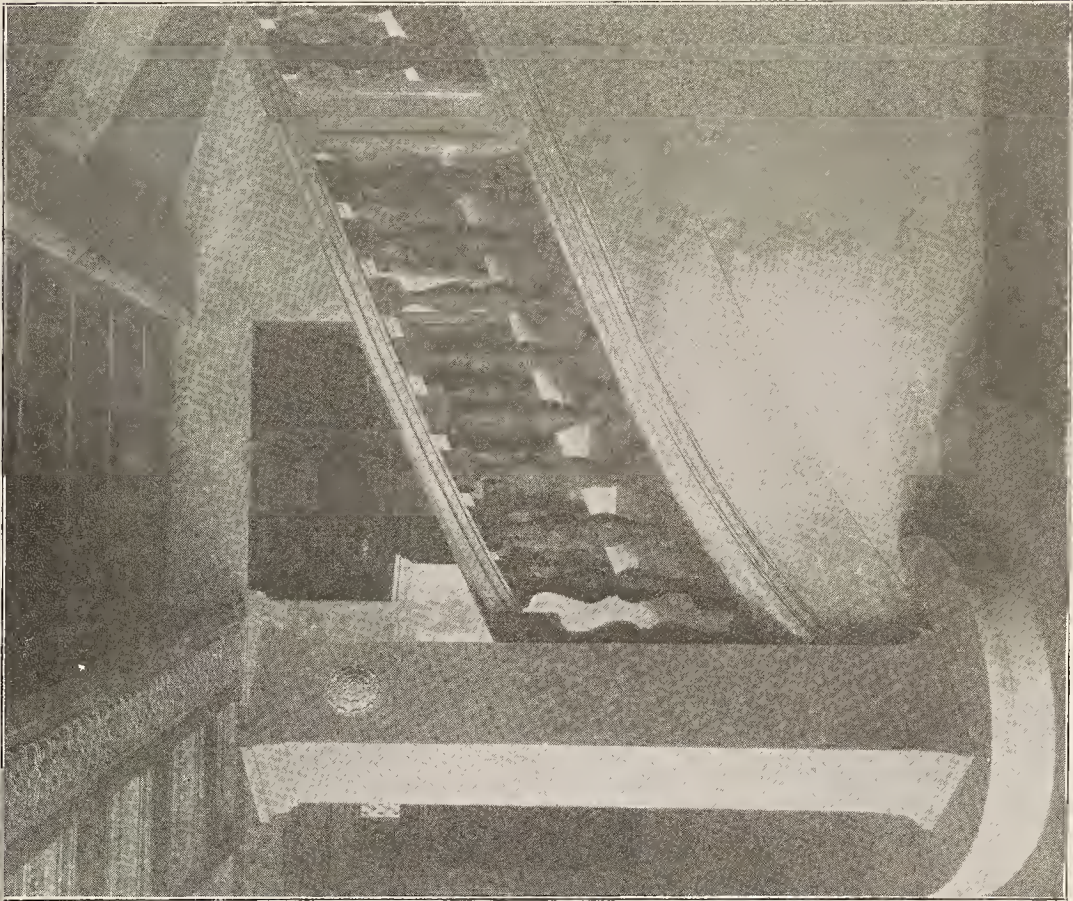
The radiator grills in the reference room are of cast bronze, left in the sand finish and oxidized to an antique green. The design is classical.

All of the bronze and iron work in above description was furnished by the Winslow Brothers Company, Chicago.





STEAM RADIATORS WITH ORNATE GRILLS.  
(See page 49.)

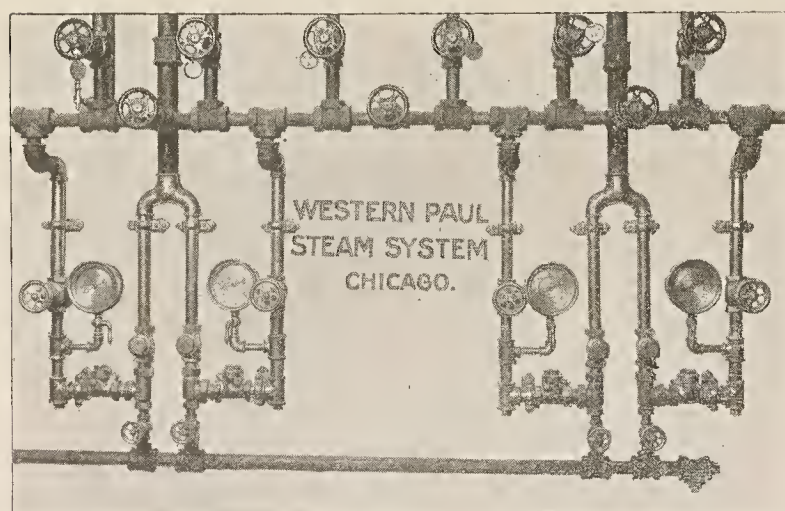


BRONZE AND MARBLE STAIRS, NORTH ENTRANCE.  
(See page 22.)



## THE DRAINAGE SYSTEM.

In modern architectural engineering the drainage problem is no longer difficult, but it still stands foremost in importance as a practical consideration. To drain every part of the building thoroughly, at all times and under all conditions of city sewerage, demanded the best efforts of engineers and contractors, especially as the basement floor was so far below the street level. Clearly,



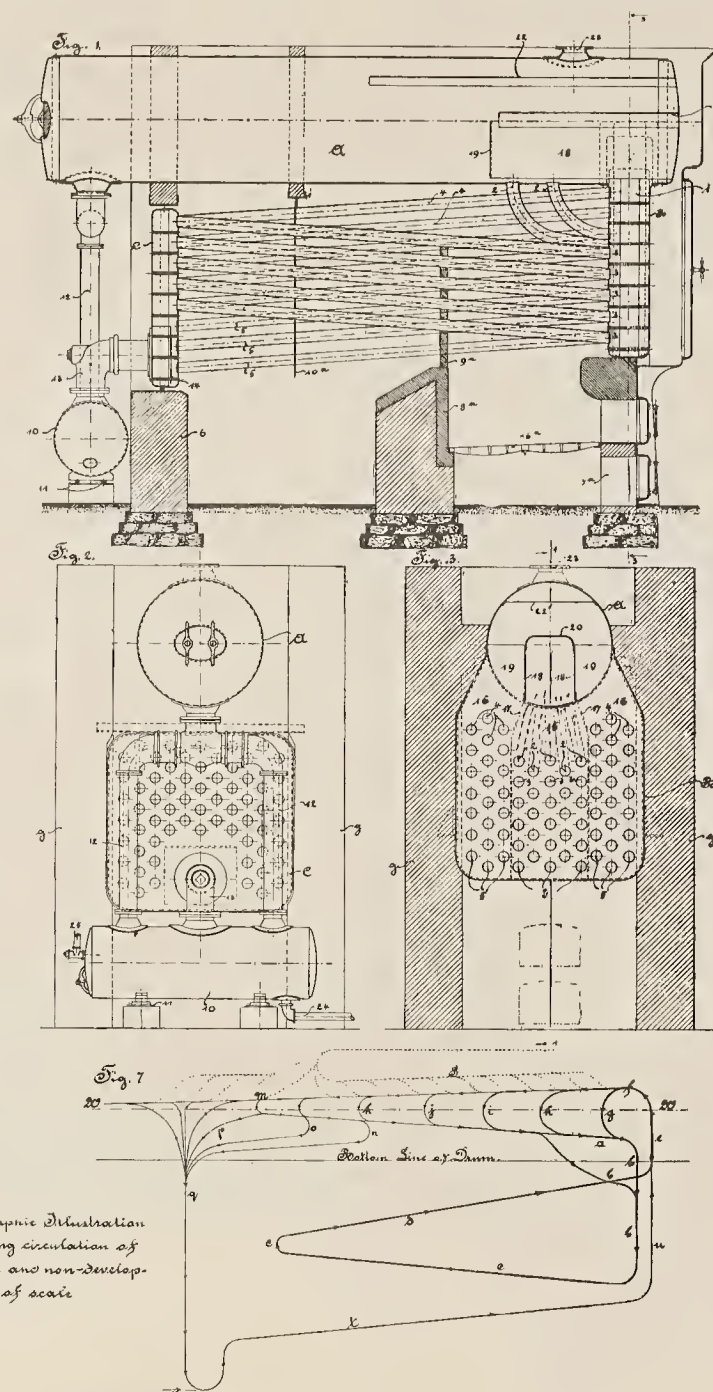
AIR EXHAUSTING GAUGE BOARD.

some system of siphonage must be adopted to insure the prompt removal of the immense quantity of water which such a large building would rapidly accumulate. Accordingly a pit was provided, into which the drainage pipes were led, and from which the drainage is lifted into the city sewers by means of an ejector. Mr. Benezette Williams, the engineering contractor in charge of this work, constructed the drains along three entirely separate systems, namely, the roof drains, floor drains and subsoil drains. On account of its importance and extent the work required the expenditure of much time and money. It included the building of heavy masonry for the ejector pit in the basement and the installation of a large ejector. Ample time has now elapsed since the completion of the building to test the efficiency of the drainage, and it is best recommended by the fact that it has given perfect satisfaction.

## THE GREAT BOILERS.

The boilers are of the "water tube" type, four in number. Three of these form units of equal size and capacity, the fourth forming a unit one-half the size and capacity of the others. The boiler plant is made up of two batteries; two of the larger units forming one battery, and one large and one small unit forming the other battery. Each of the larger units contains 2,431 square feet of heating surface, and the lesser unit contains 1,226 square feet; making a total of 10,950 square feet of heating surface for the entire boiler plant. The boilers are made of steel throughout, and are of special and new design, the object being to provide such boilers as would generate the maximum amount of steam with the minimum amount of fuel; also, to control the circulation and feed-water so that all impurities and minerals contained in such feed-water shall be precipitated into a receptacle for that purpose, thus keeping the boilers free from scale. In the accompanying drawings illustrating the boiler, Fig. 1 is a longitudinal section; Fig. 2 is a rear elevation; Fig. 3 is a front elevation of boiler with boiler front removed, and Fig. 4 is a "circulation" diagram. A maximum efficiency is obtained by causing the water

to circulate through the tubes with the proper velocity and exposing said water in the tubes to the heat in the most intense degree. In these boilers the circulation is equal in its various sections, so that each and every row of tubes is doing an equal amount of work. Each boiler is so constructed that each part is calculated to cooperate with every other part, in order to obtain the most desirable results. A uniform circulation is obtained by making the inlet and outlet area for circulating water equal to the combined area of the tubes which it feeds and relieves. The design of baffle-plate in steam drum is also new. All parts of boiler are easily accessible. The workmanship in above boilers cannot be excelled, and the entire plant was designed and erected by the old and well-known firm of John Mohr & Sons, of this city. These boilers were selected not because of cheapness, but for their excellent quality and their fulfillment in the highest degree of all requirements, according to the decision of the committee of engineers to whose criticism all competing boilers were subjected;



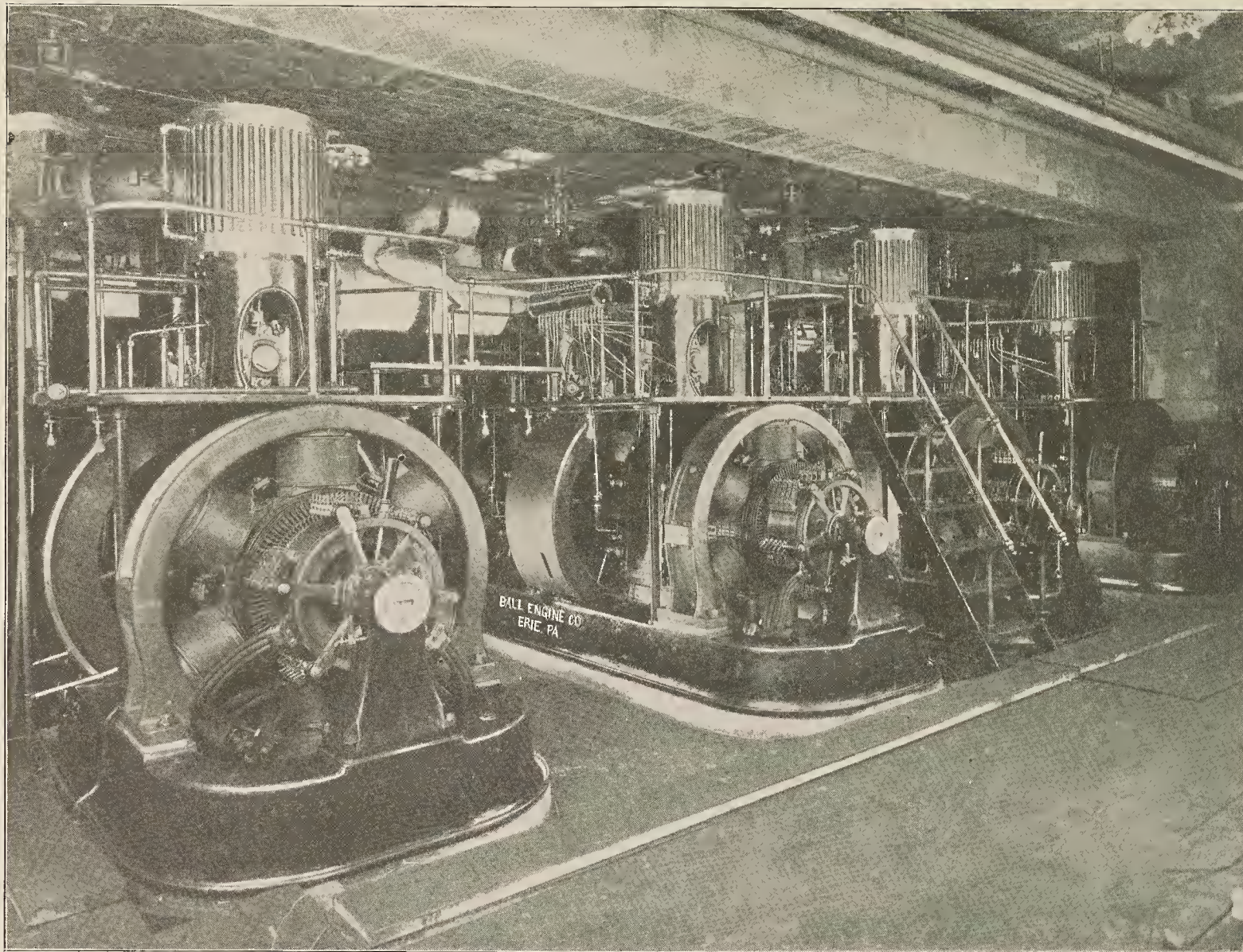
SECTIONS OF BOILERS, SHOWING WATER CIRCULATION.





THE GREAT BOILERS.





ENGINES AND DYNAMOS.

and this selection was made notwithstanding the most severe competition of every kind from all sources.

#### ENGINES.

The engines are of the vertical type, consisting of five in all—four of them being cross compound engines, 250 horse-power each; the fifth engine a tandem compound vertical of 75 horse-power.

Each of these engines is direct connected to two General Electric generators, both the generators and engines resting on a substantial and handsome iron subbase conforming to the general design of the engines. The three cross compound verticals are arranged with governor wheel in center between the housings. The general appearance of the plant is very pleasing, and the engines run very quietly. The entire plant reflects great credit on the manufacturers, the Ball Engine Company, of Erie, Pennsylvania.

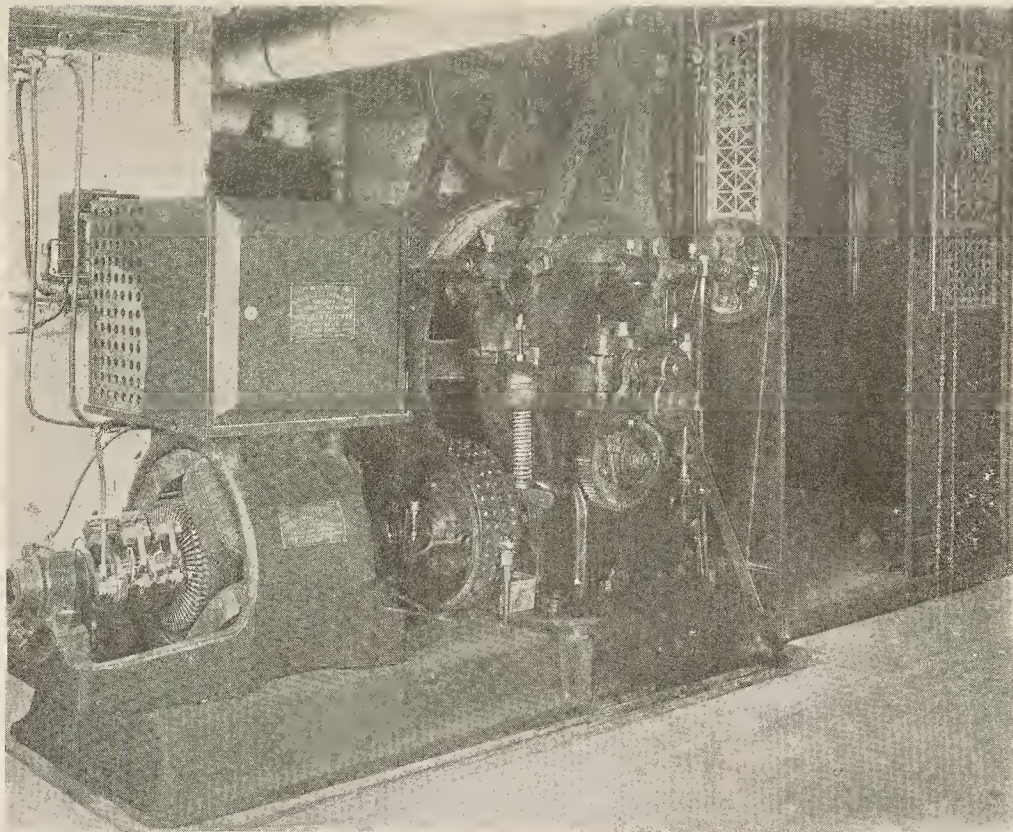
One feature of these engines which is very important, especially in a plant so compact as this one, is the original and peculiar form of the housings, which gives not only opportunity for adjustment of shaft in all directions, but allows its entire removal without disconnecting any of the upper parts of the engine. This is accomplished by introducing the shaft boxes into a large jaw, cut into

one side of the housing deep enough to bring the center of the shaft in a plane with the center of the housing. The boxes consist of one lower, two quarter, and one top box for each journal, and are provided with removable babbitt metal shells upon which the journals bear. These shaft box jaws are in turn closed by the use of heavy struts fitted so that when bolted in, the jaw is closed and completes the symmetrical strength of the four corners of each housing—each strut being fitted so that there can be neither contraction nor extension of the outer end of the jaw.

The adjustment of the boxes is accomplished by turning three set screws in each strut—the two in the center reaching the quarter boxes, while the third one above operates either in or out a wedge which fills between the outer side of the jaw and housing in the top box, thus giving independent adjustment for the three parts of each box, while the lower box is perfectly free to move at right angles to the axis of the shaft—thereby giving for all positions of adjustment of the quarter boxes a full bearing for the shaft.

Above the openings for the shaft, the housing becomes a round, taper column, having on two sides of its inner surface crosshead guide surfaces, which are cast in place and bored out coincident with the boring and facing of the upper end for the reception of the cylinders, at the lower end for its seat upon the





ELECTRICAL ELEVATOR MACHINERY AND CAR.

base. In this form of housing a structure is obtained that is strong, convenient of access when desired, and clean.

The valves are of the double-face telescopic relief type with boiler pressure on the inside, a sufficient amount of unbalanced area being left on the faces so that the steam on the inside forces the two faces apart, causing each to rub against the seat with sufficient pressure to keep the surfaces polished and steam-tight throughout the entire life of the engine.

The governor is of the well-known inertia type, and the regulation is so perfect that although these engines are used both for electric lighting and for elevator service, yet there is no sign of drop in the lights when the elevators are started.

The galleries of these engines are also very handsome and complete and the general finish of the engines is admirable.

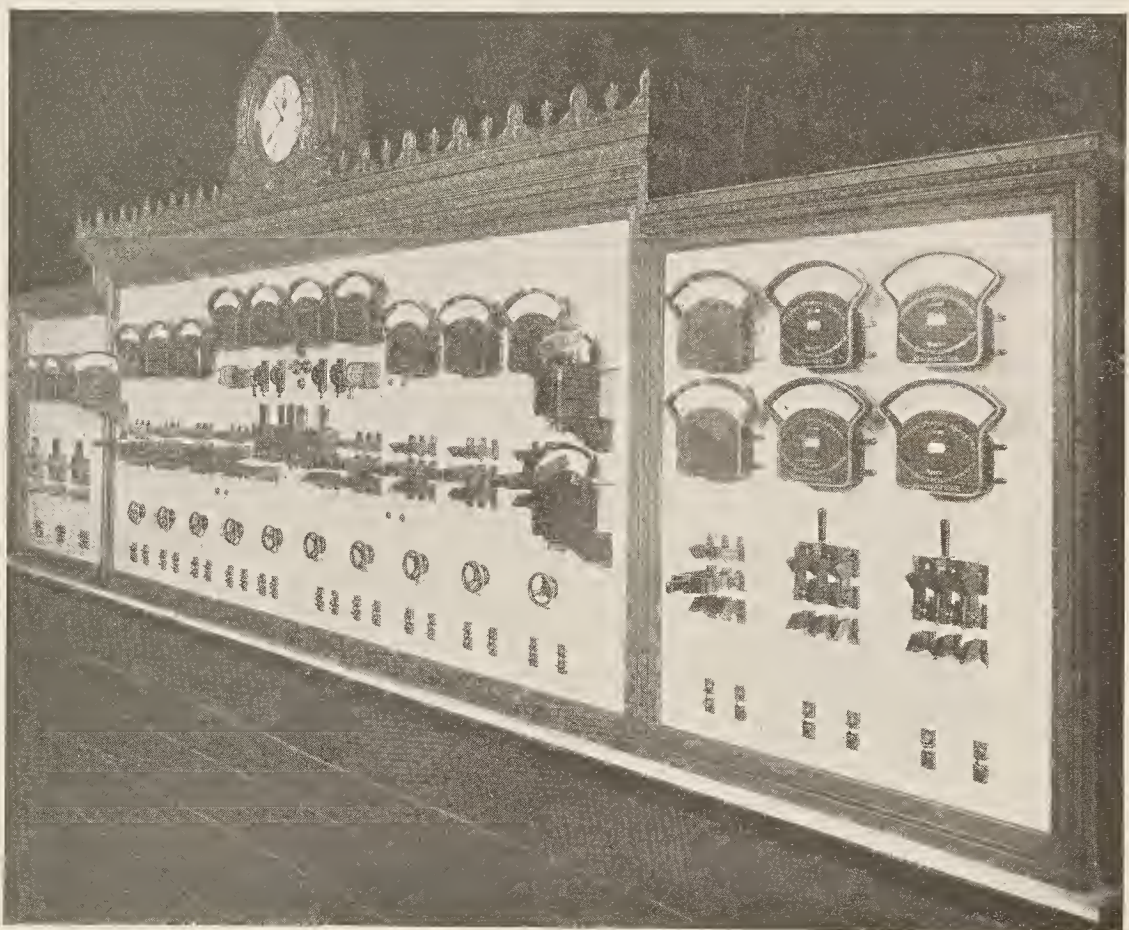
#### MACHINERY AND ELECTRICAL PLANT.

The dynamo plant consists of ten Edison multipolar dynamos of the modern type. Eight of these are of 75 and two of 25 kilowatts each, the latter to be used during the day and early in the morning when the load is light. This plant is capable of furnishing the requisite current for

13,000 16-candle-power lamps. All of these machines are connected directly with the engine shafts, each engine running two dynamos.

At the north side of the dynamo room stands the switchboard, upon which are the devices for controlling the machines. This is built of Italian marble in three panels, the center panel being about eight feet square, and the two side panels being of about the same breadth but not quite so high. Each panel is finished at the edge with bronze trimmings and surmounting the center panel is a handsome marble clock trimmed in the same manner as shown in the illustration. Upon the center panel are mounted the dynamo switches and the resistance box switches, the boxes themselves being upon the rear of the board; also ground detectors, dynamo ampere meters of Weston switchboard type, voltmeters and galvanometers. Upon the right-hand panel are mounted the switches for the feeders for lighting current, together with the ammeters measuring the current of same; and upon the left-hand panel are the switches, etc., for the power circuits. Both dynamos and switchboard were installed by the Chicago Edison Company in their superior manner so well known to architects.

The board is supported by iron construction and stands well out from the wall of the engine room. The rear is very accessible,



MARBLE AND BRONZE SWITCHBOARD, AND THE MASTER CLOCK.





PHOTOGRAPHY.

ENTRANCE TO DELIVERY ROOM FROM GRAND STAIRWAY.



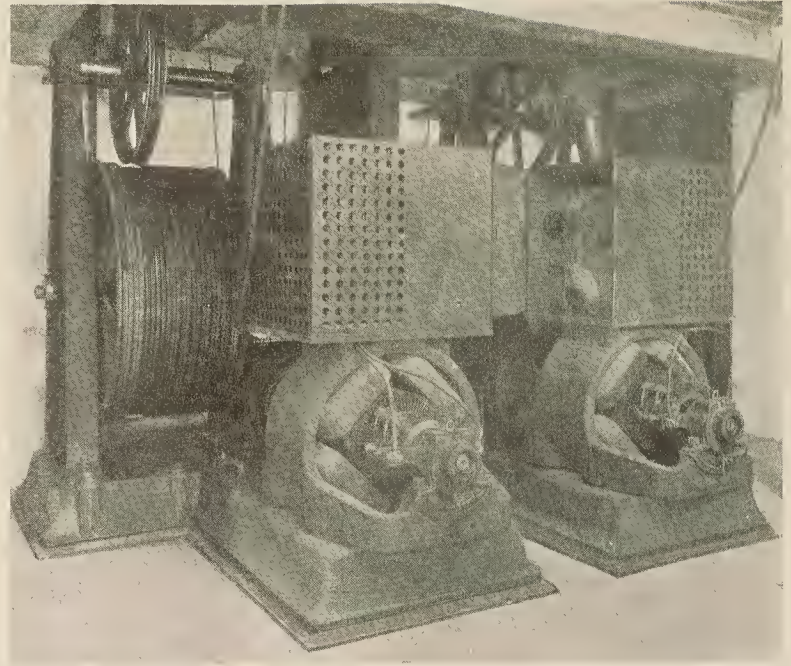




finished in a neat and workmanlike way and well lighted. All connection between the dynamos and the board is effected by cables running beneath the floor. In building and equipping this board every possible contingency has been considered, whether of throwing machinery together in temporary arrangement in case of accident, or of unusual occurrence requiring a large quantity of current in one portion of the building, or in case of any possible necessary repairs. The whole is a model example of the electric light engineering of the age.

## MOTORS.

The fourteen motors used in driving the low-speed fans for the ventilating and heating system are of the Crocker-Wheeler Electric Company's bi-polar type, ranging from 1 horse-power to 5 horse-power, the armature shafts being fitted with rawhide pinions, engaging in steel gears on shafts which in turn transmit their power to the fan shafts. The Crocker-Wheeler Company are now manufacturing extremely low-speed motors which are designed for direct connection, by the use of which the gearing, always a source of lost energy, may be done away with. The illustration shows one of this type of motors. The armature is to be keyed directly to the driving shaft of the fan or such other machine as is to be operated, and the field casting bolted to the bed-plate or frame. These motors are rated on a basis of their output in horse-power at 100 revolutions per minute, and are known as the sizes  $\frac{1}{2}$ -100, 1-100, 2-100, 3-100, 5-100, etc., the  $\frac{1}{2}$ -100, for example, giving  $\frac{1}{2}$



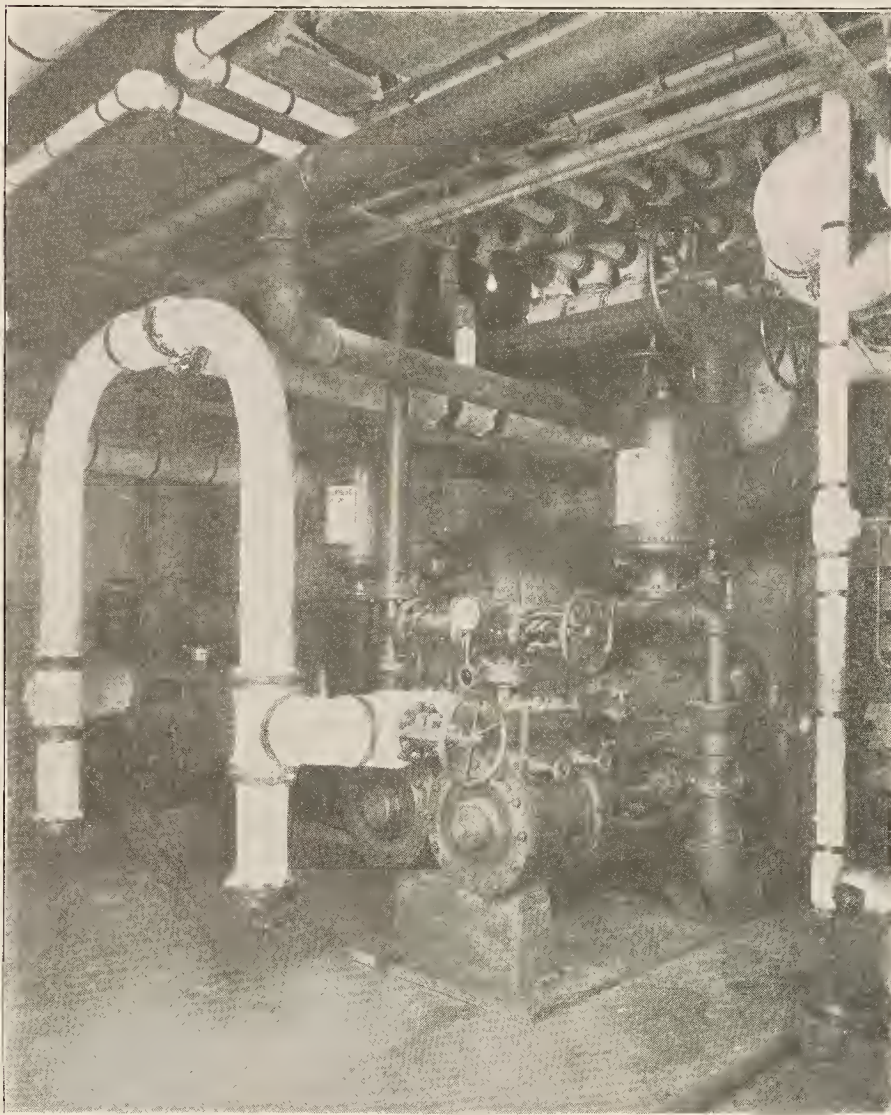
DOUBLE ELECTRICAL ELEVATOR MACHINERY.

horse-power at 100 revolutions per minute, or 1 horse-power at 200 revolutions, and so on, and the 5-100 giving 5 horse-power at 100 revolutions per minute or 15 horse-power at 300 revolutions per minute, each machine being designed for the special output and speed required in any particular case. By the use of a controller in the field circuit the speed of these motors may be varied at will without sacrifice of efficiency. As the armatures are short and of comparatively large diameter a minimum of space is occupied, which is often a most important consideration.

The Crocker-Wheeler Electric Company is represented in the West by Mr. C. H. Wilmerding, with offices at 1514-1516 Old Colony building, Chicago.

## ELECTRIC ELEVATOR SYSTEM.

Rapid, commodious and efficient elevator service was one of the most important considerations in planning the Library building, since some of the largest public rooms are located on the upper floors. Electric elevators were chosen, because they are especially adapted to buildings of moderate height, and also because they combine all the good qualities of rapid and noiseless running, cleanliness, safety, etc., so desirable in residences and other really fine structures. Ten electric elevators, made and installed by the Crane Elevator Company, comprise the equipment of the Library. The illustration shown herewith gives an excellent idea of the general plan of the Crane electric elevator as used in this building. Its principal points of excellence are its smooth and noiseless action, easy control, easy stopping and starting, quick starts, great economy of current in starting and under all conditions of operation, control of speed, impossibility of overloading, perfect automatics under all conditions of speed, high speed that can be obtained, great strength of construction and accessibility of all parts. These points will be readily appreciated as of especial value in an elevator which is designed for the highest grade of passenger service. Unlike the hydraulic types of elevators made by the Crane Elevator



UNDERWRITERS' FIRE PUMPS.





ORNATE RADIATOR.

Company, as, for example, their horizontal and vertical passenger elevators and their plunger type of high duty hydraulic, these electric elevators require but small space, and can be operated, within certain limits as to height, at slight expense for running or maintenance. Like every other equipment of this magnificent building, the electric elevators represent the highest attainments which the science of elevator building has yet reached.

## FIRE PUMPS.

The accompanying illustration shows two 16 by 9 by 12, 750-gallon capacity each, Fairbanks-Morse Underwriter Fire Pumps. These pumps were built by Fairbanks, Morse & Co. at their Beloit works, and installed by them for fire protection in the Chicago Public Library, Chicago, Illinois, being especially designed with a view of reaching the highest results. Great attention has been given to reducing the friction of the water to a minimum. The large valve areas, together with well-rounded and large water passages, accomplish this end. These pumps will commend themselves for their high grade, economy, superior construction and design. They are built to conform to special specifications prepared by John R. Freeman, Engineer and Chief Inspector for the Associated Insurance Companies, and issued by these companies, and on account of their special construction can be started at once without danger, which makes them especially desirable for quick fire service.

All parts are made to template and like parts interchangeable with each other. The valve motion is of new and superior design throughout, which enables them to run at a very high rate of speed without jar or any possibility of derangement.

The Fairbanks-Morse Underwriter Fire Pumps have recently been installed in the following buildings in Chicago: the Western Electric Company, one 1,000-gallon capacity pump; the Steger Piano Company, one 750-gallon capacity pump; the National Malleable Castings Company, one 1,000-gallon capacity pump; the Counselman Elevator Company, one 1,000-gallon capacity pump; and also the School Seat Furniture Company, Grand Rapids, Michigan, one 1,000-gallon capacity pump; the Studebaker Bros. Manufacturing Company, South Bend, Indiana, two 1,500-gallon capacity pumps; the Birdsell Manufacturing Company, South Bend, Indiana, one 1,000-gallon capacity pump; the Clinton Woolen Manufacturing Company, Clinton, Michigan, one 1,000-gallon capacity pump.

Fairbanks, Morse & Co. are prepared to furnish all

sizes of pumps, from the 2½ by 3 by 4 boiler feed pumps to the large compound condensing waterworks pump of 4,000,000 gallons capacity. Fairbanks, Morse & Co. will be pleased on inquiry to forward detailed information regarding pumps.

## COAL AND ASH MACHINERY.

An interesting feature of the building is the coal and ash-handling machinery, part of which is shown in the illustration. The coal is unloaded from wagons into the large receiving tank, which holds sixteen tons. From this tank it runs into an automatic scale, is weighed and discharged into the incline conveyor, which discharges it into the conveyor that carries it over the prismatic light roof. It is then dropped into steel storage hoppers having a capacity of fifteen tons, which are suspended from the roof of the boiler room. There are located a number of adjustable spouts, with gates opened from the boiler room floor, by which any quantity of coal required can be discharged on the fireroom floor.

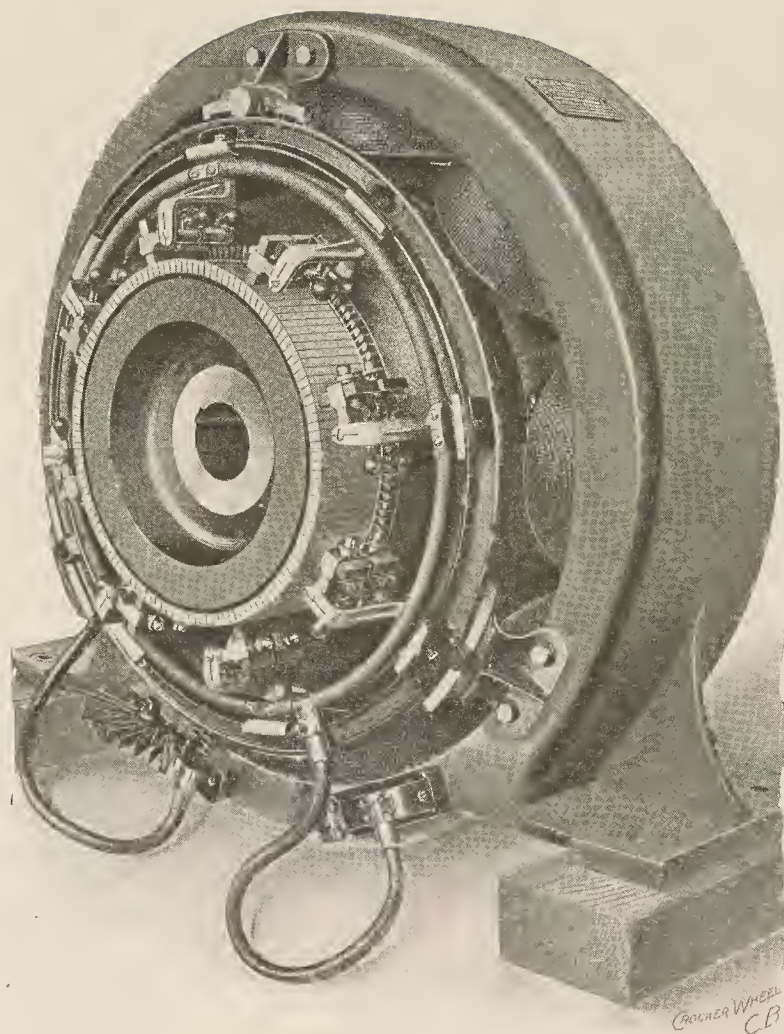
The ashes are handled without making any dust, which is quite a feature in a building so elaborately finished as the Library, and reflects great credit on the Borden & Selleck Company, of Chicago, who manufactured and installed the entire plant.

The ashes which are constantly falling through the grate bars are caught in a steel receiver with dust-proof doors, the receiver being of sufficient capacity to hold the day and night run of ashes. In the morning they are dampened down, the doors are opened, a small steel hopper car is run in front of each door, and the ashes are drawn into it. The car is then pushed through a subway



COAL AND ASH CONVEYORS.





DIRECT-CONNECTED ELECTRICAL MOTOR.

under the area-way and dumped into the boot of the ash elevator and lifted up and discharged into the ash tank, from which the ashes are spouted into wagons. The casing around the bucket elevator, the discharge into ash tank, and the tank itself, are perfectly dust-proof. This machinery is driven by a 7-horse-power motor.

## STEEL FLOORS.

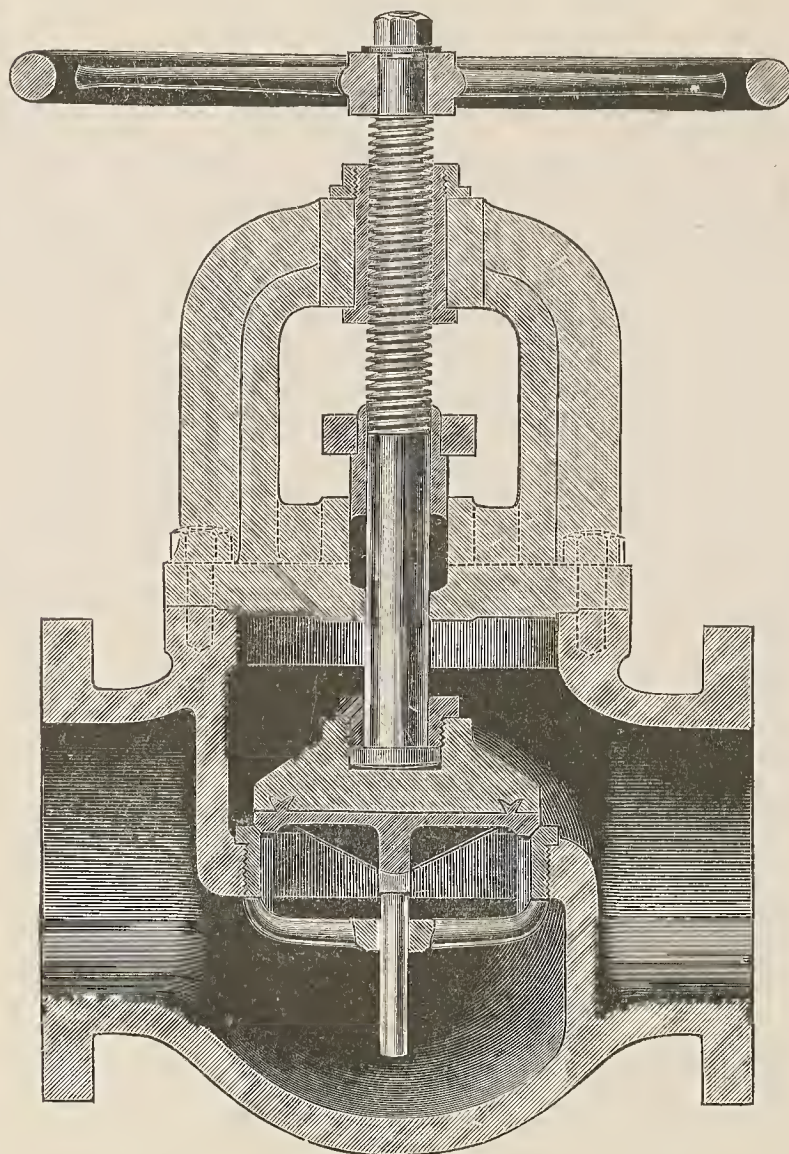
The essentials of perfect fireproofing made it necessary to construct an iron floor in the boiler room, on which the coal for furnaces is handled and from which all dirt, ashes, etc., are readily removed. This floor is raised somewhat from the lowest level of the basement, and is supported by a framework of structural iron resting on iron columns. The floor proper is made of steel plates which are bolted to an iron frame. An arrangement is made whereby cars of coal are run in and dumped on this floor. On either side are galleries, similarly constructed, from which visitors can enjoy a view of the boiler room.

Mr. Albert H. Wolf, civil engineer and contractor, executed this contract. The riveted method of construction has been used by Mr. Wolf in a number of the bridges and buildings built by him. Mr. Wolf designed and erected the structural ironwork for the Telephone building in Chicago ten years ago. It is located at Franklin and Washington streets, and is the first office building in Chicago in which riveted columns of rectangular section were used. Since that time Mr. Wolf has used the same method in the construction of the Chicago Great Western Railway Depot, McVicker's Theater, University Club, and the Pabst office building and Sentinel building at Milwaukee; also in a number of

breweries, and at present is building two breweries and one malt-house in which he is using the same system of riveted steel columns. The Pabst office building at Milwaukee — built in 1891 — was the first building in which columns with longitudinal splice-plates were used. These columns were designed by Mr. Wolf, and in this building a rational system of wind bracing was used for the first time in an office building. Since the construction of the Pabst office building, almost all of the office buildings in this country have been designed with columns having longitudinal splice-plates. Mr. Wolf also furnished the structural ironwork for the Western Bank Note building, Calumet Club, Winamac and St. Germaine fireproof apartment buildings, Alexian Brothers' Hospital, Joliet Courthouse, United States Post Office and Customhouse at St. Paul, Dubuque Brewery and many of the largest breweries in Chicago, besides the bridges of the Chicago Belt Railway and other railroads.

## RADIATION.

The contemplation of the satiating series of architectural beauties displayed in the elegance of proportion and by the wealth of decorative detail in each of the spacious chambers of the Chicago Public Library so completely absorbs and enthralls the sensibilities of the spectator that no thought is given to the subtle, delicious influence of the even, perfect temperature or atmosphere imparted by the heating and ventilating system therein installed.



SECTIONAL VIEW OF VALVES.



The perfection of the system, the resulting influence of which so lulls and charms the senses to complete serenity, even to entire absence of thought of it, in truth bespeaks most eloquently the highest appreciation by the visitor of this most essential feature of any large building situated in the rigorous, capricious climate common to this section of the country.

Naturally, the most important part of a heating apparatus is centered in the heat distributors—or radiators. The product of the American Radiator Company was chosen—the fact of their radiators being used in practically all of the modern, palatial office and public buildings throughout the United States in itself guaranteeing at once the high quality of the goods and evidencing the splendid indorsement of their efficiency and durability by the leading heating experts everywhere. To be symphoniously in accord with the decorative treatment of the building, many of the radiators are inclosed by ornate iron grills, which in themselves are unequaled specimens of the ironmolder's art, and most convincingly attest the skillful workmanship of their artisans.

The American Radiator Company maintains branches at Chicago, New York, Boston, Philadelphia, Buffalo, Detroit, St. Louis, Minneapolis, Denver and London, where they at all times cordially welcome the calls or inquiries of architects or others interested in their line of radiators and house heating boilers.

#### RADIATION PIPES AND VALVE SYSTEM.

About thirty-two thousand square feet of direct radiation are used in heating the Library building. The Paul system, described elsewhere in this connection, is used to insure perfect circulation. Wherever radiators are used they are of special design and very artistic, and conform to the interior finish of the building. The heating contract was executed by the D. M. Quay Company and received their closest attention throughout. The inspection of the work was especially rigid—the most exacting known to the trade—and great credit is due to the contracting firm for the thoroughness of their work. After erection, the entire system was tested to withstand 250 pounds hydrostatic pressure, and later on they passed the final test under 250 pounds of steam.

The specifications called for high-pressure steam piping of extra strength, the 7-inch pipe being  $\frac{7}{16}$  inch thick and the 10-inch pipe  $\frac{1}{2}$  inch thick. The construction of the valves and fittings, thickness of the iron and copper pipes, and other mechanical points, were given in detail. The contractors, the D. M. Quay Company, placed the order for the complete piping plant with the Crane Company, and had the material cut and fitted at the factory ready for erection. Under the specifications, which were unusually stringent, it was necessary to assemble the work on the shop floor, in as large sections as could be put together and in the presence of the superintendent for the Board, or his representatives, apply a hydraulic test pressure of 800 pounds per square inch on each section. This inspection was not a formal one by any means, the inspectors bringing their own pressure gauges, and after satisfying themselves that the full pressure called for was being applied, they stamped each piece of pipe valve and fitting. The section was then taken apart and delivered at the building. No piping material unless so stamped was allowed to be brought in.

Nearly all the valves in the plant are Crane Company's high-pressure angle or globe valves with solid gun metal disks and spindles, the seats and stuffing box glands being of the same metal. The edges of the flanges and the hand wheels are turned and polished, and the backs of the flanges faced at the bolt heads. The illustrations show sectional views of valves and flanges.

All fittings 2 inches and larger are the Crane Company's extra heavy flanged pattern with the edges of the flanges lathe-turned

and polished, and the backs of the flanges spotted for bolt heads to correspond with the valves.

The flanges are of cast iron, very heavy, and are shrunk on the pipe, which was previously turned off true in a lathe to the depth of the flange. The ends of the pipe were peened over into a recess on the face of the flanges. After both flanges were in place the piece was swung in a lathe and the flanges refaced, the ends of the pipe being turned off true with the faces of the flanges at the same time. This insured both flanges being absolutely parallel and made a bearing for the gasket on the end of the pipe itself.

All flanged joints are male and female with a copper gasket in the female recess.

#### AIR-EXHAUSTING SYSTEM.

Heating at the minimum of expense is an accomplished fact in the Library building. The secret is the use of exhaust steam from the engines. Steam at atmospheric pressure is circulated to every nook and corner of the piping and radiators and kept at even heat, by the removal of air from the heating system. This is accomplished by what is known as the Paul system, introduced by the Western Paul Steam System Company, of the Fisher building, Chicago.

Each radiator is supplied with an air valve, which closes automatically when heated by steam from within, and opens when cooled by an accumulation of air in the radiators. These air valves are connected by continuous piping leading to the basement to the exhausting apparatus. The air is first exhausted from the entire system of pipes and radiators; then the exhaust steam from the engine is admitted and makes its way by atmospheric pressure to every remote corner. As soon as the air valves become warmed by the steam, they close automatically by expansion of the metal of which they are made. When the steam condenses and cold air accumulates back of the air valve, they open by contraction and the air is at once exhausted, and gives place to warm steam. In this way the entire radiating system is kept at an even temperature and the building is heated at practically no additional expense whatever for fuel, and without the slightest back pressure on the engines.

#### OUR ILLUSTRATIONS.

A word of tribute to the skill and enthusiasm of the photographers and engravers by whom this Supplement has been illustrated is proper in conclusion. The very highest achievements in the art of photography have been employed to secure the interior and exterior effects herein shown. The photographs of the marbles, the mosaics and the bronzes are, for the most part, the work of Reginald Capes, of Chicago. The matchless flash-light reproductions of the machinery, many of the bronzes, and the several exterior views, were made by Mr. George R. Lawrence, of the firm of Lawrence & Dinius, Chicago. In the work of interior flash-light photography it is safe to say that Mr. Lawrence has no superior, if indeed an equal, in this country. The half-tone plates, of which the specially fine quality will be noted, were made by the United Engraving Company, of Chicago, to whom much praise is due.

The aim in this description has been, both by text and illustration, to afford the reader a definite idea of the details of construction, size, arrangement and excellence, of the Chicago Public Library, much of which information is necessarily concealed from public view in the building itself. It is with the hope and expectation that this necessarily brief treatise will be of value to our readers, and especially to the architectural profession, that the publishers now submit it to the candid judgment of their readers.



# THE PEOPLE WHO CONSTRUCTED THE CHICAGO PUBLIC LIBRARY BUILDING,

And to Whom Credit is Due for Superior Workmanship and Materials.

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